6000 0704

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud Drill Hole File - Hole No. RS-477-99
AUTHOR	D. Mackerrow; K. Allen; K. Meyer; D. Francisco; M. Niemi
DATE OF DOC(S)	1999
MULTI_DIST Y / N? Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Hecla Mining Co; Rosebud Project Newmont Gold Corp.; Rosebud Mining Co. LLC
COMMODITY If not obvious	gold; silver
NOTES	drill logs; geology; assay; total depth 2232' receipts; geochemistry; handwritten notes 119p

Keep docs at about 250 pages if no oversized maps attached (for every 1 oversized page (>11x17) with text reduce the amount of pages by ~25)

SS: DP 4/29/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

RS-477

6000 0704
4010

477

- ☐ quartz, chalcedony, silicification
- ☐ faults, fractures
- ☐ FeOx
- ☐ sulfide
- ☐ calcite, carbonate
- ☐ argillization, white clays
- ☐ propylitization
- ☐ potassic alteration
- ☐ chlorite, chloritic clays

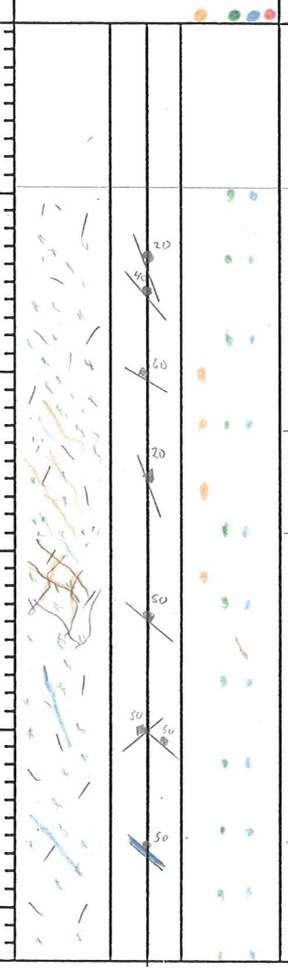
Intensity . . . — — —

6080 0704

Hecla MINING COMPANY

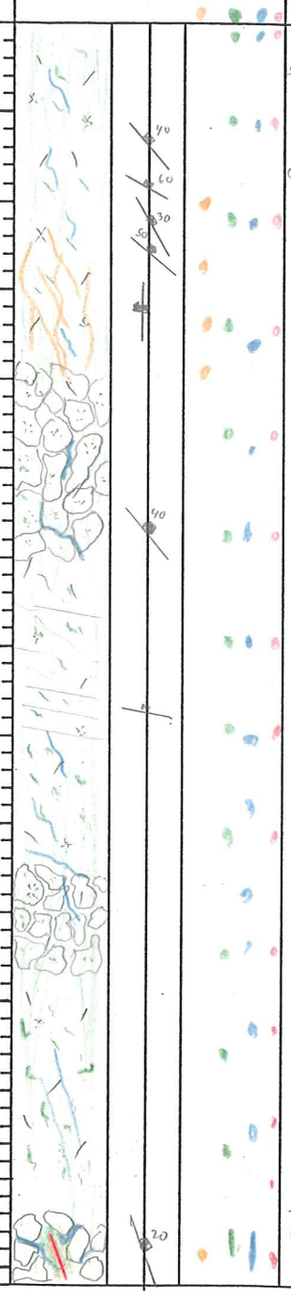
ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	1	LOCATION	North area targets	REMARKS	
PAGE 1 OF		NORTHING		Drill site C	
DATE	10-27-99	EASTING			
LOGGED BY	D. G. Mackterrow	ELEVATION			
SCALE	1" = 10'	AZIMUTH	S 30°E		
TOTAL DEPTH		INCLINATION	-60		

LITH	OX/RE	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
Td	R	1539.5 - 2004.7 DOZER Fine grained to aphanitic Flow. Elongated vesicles forming weak trains. Vesicles are chloritically altered core is a pale greenish white. Disseminated pyrite is ≈ 1-2% Pyrite 1563 white clay	1530 1540 1550 1560 1570 1580		1550 vesicles orientation 300 to 1553 1562-1565 Fracture swarm	1539.5 Calcite veinlets and weak chloritic alteration 1545 Pyrite disseminates out of 200 to 6x ¼" 1550-1565.5 white clay on fractures. 1562-1565 Fractures coated with white clay Marcasite is only at trace levels in fracture zones and generally as pyrite after marcasite

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	A
1539.5	1545					
1545	1548.5					
1548.5	1557					
1557	1561.5					
1561.5	1566.1					
1566.1	1576					
1576	1584					

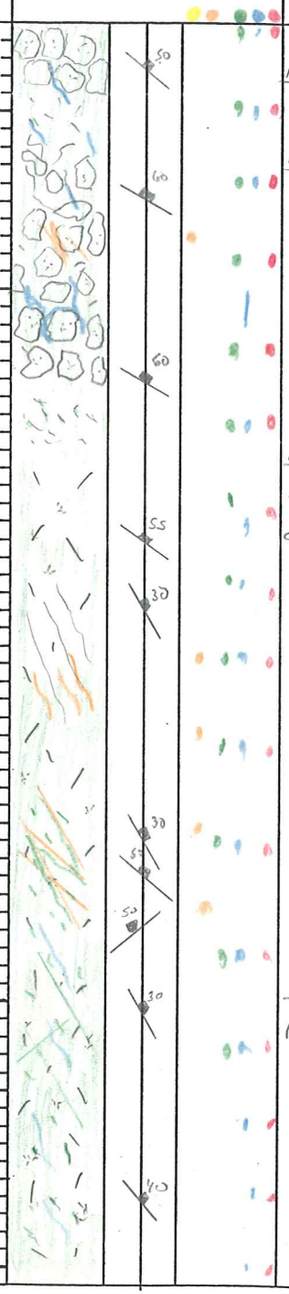
HOLE NUMBER RS-477-99 PAGE 2 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
Td	R	1539.5 – 2004.7 DOZER Fine grained rhyolite flow is vesicular texture continues 1599.5-1610 Variable-intensity auto breccia texture forms. Expansion is minimal 1610 – 1626 Healed fracture where auto breccia did not completely develop 1648.5 20° tca fracture with traces of argillization in surrounding rock. Fine dark py ± marcasite coat shear plane	1580 1590 1600 1610 1620 1630 1640 1650		1591.5 – 1599.5 Fracture zone with white clay on fractures 1648.5 – Shear on 20° tca fracture	Calcite veinlets continue. Disseminated pyrite continues at ≈ 1-2% 1648-1649 Calcite veinlet surround sulfide coated fracture

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2
1576	1584				
1584	1591.5				
1591.5	1599.5				
1599.5	1605				
1605	1610				
1610	1620.5				
1620.5	1631				
1631	1641.5				
1641.5	1647				
1647	1650.5				

HOLE NUMBER RS-47 7-99 PAGE 3 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
Td	R	1539.5 – 2004.7 DOZER Fine grained to aphantic rhyolite flow continues texture also contains local autobrecciation and vesicle.	1650 1660 1670 1680 1690 1700 1710 1720		1644 – 1652 Autobreccia 1656.5 – 1670 Autobreccia 1677.5 – 1700 Elevated fracture density 1700 – minimal fracture in	Disseminated pyrite continues at ≈ 1% 1662.5 4" fracture zone with white clay filling 1686.7 – 1690 white clay on fracture surfaces 1695 – 1700 chlorite increases on fracture surface	1652 1656.5 1667 1677.5 1686.5 1689.6 1695 1700	1656.5 1667 1677.5 1686.5 1689.6 1695 1700 1710 1720				

1700 – 1708 Vesicle increase in size to 3-4mm

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES
840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 359-2944

Kurt Allen
Hecla (Rosebud Mine)
P.O. Box 2610
Winnecmucca, NV 89446 US

Invoice No: 33100286
Invoice Date: 12/27/99
JobNo: 99-46-06
Account No: 00007292

Client PO: RS-477-99

INVOICE

Terms: Net 30 days

Item Description	Qty	Unit Price	Amount
Prep 11/15lbs Dcore	91	$2.98	$271.18
Composite	91	$0.70	$63.70
Au FA/AA/AAS	92	$6.50	$598.00
30 element ICP	14	$7.65	$107.10

Sub Total:	$1,039.98
Discount:	$0.00
Discounted Total:	$1,039.98
Add'l Discount:	$0.00
Final Total:	$1,039.98

PLEASE REMIT TO:

Inspectorate America Corp.
P.O. Box 201901
Houston, TX 77216-1901

RS-477

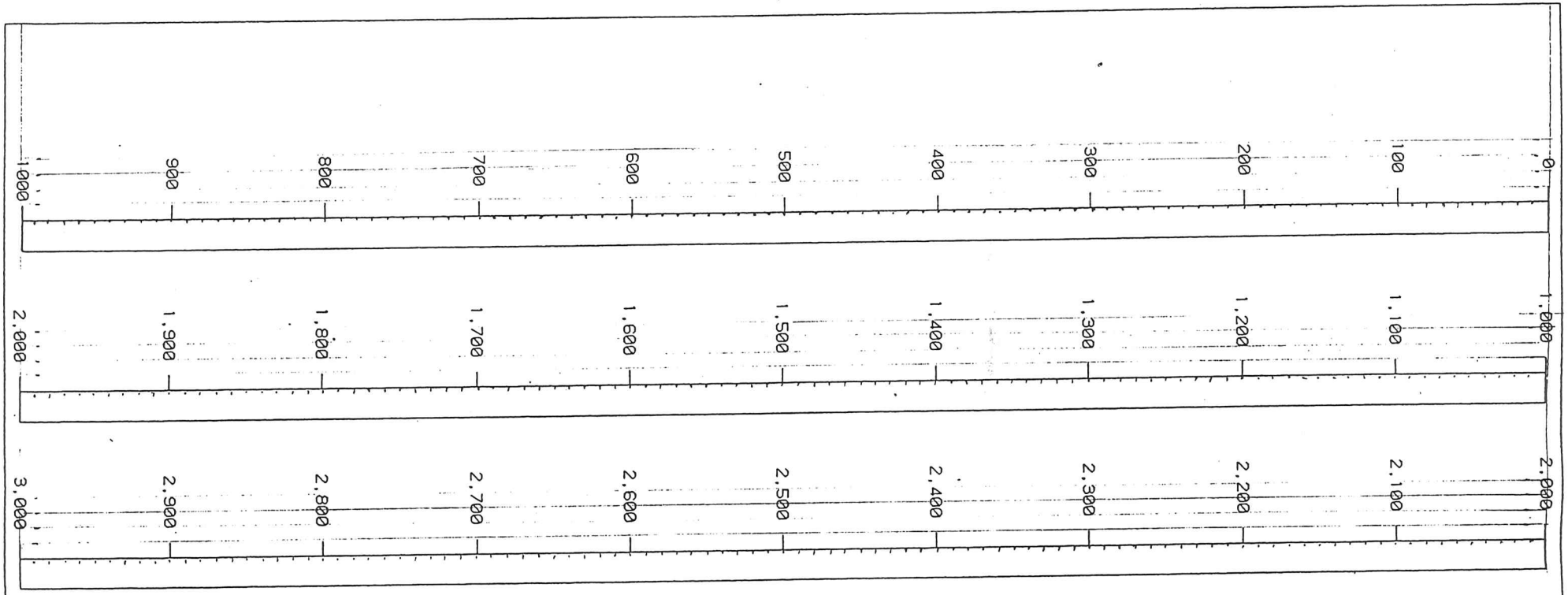
PAID

SURFACE DRILLHOLES
1-10-00
DHSTAKE.RW5 01/10/00 14:10:02

JOB:Name: DHSTAKE	Date: 7-3-1991	Time: 22:31:10.95		
M Setup:North Azimuth	Units: Feet	Scale: 1.000000	Curvature: Off	Angle: Degrees
Store:Point: 1	North: 2,204,321.0430	East: 482,158.2690	Elev: 5,414.00	DOZER
Store:Point: 2	North: 2,203,661.3400	East: 479,120.5940	Elev: 5,132.70	94003
Store:Point: 3	North: 2,206,056.0830	East: 479,594.8790	Elev: 5,646.44	USMM207
Occupy:Occ: 2	North: 2,203,661.3400	East: 479,120.5940	Elev: 5,132.70	94003
Backst:Occ: 2	BS pt: 3	BS azm: 11°12'09"	BS crl: 0°00'00"	
HI/HR :H Inst: 5.06	H Rod: 6.00			
Sd Shot:2-8	Ang R: 345°35'39"	Zen: 81°16'03"	S Dst: 2,030.665	478
Sd Shot:2-9	Ang R: 359°55'08"	Zen: 78°49'34"	S Dst: 1,951.520	477
Sd Shot:2-10	Ang R: 358°25'43"	Zen: 81°17'07"	S Dst: 1,321.590	476

SURFACE DRILLHOLES
1-10-00
DHSTAKE.CR5 01/10/00 14:10:52

Point	Northing	Easting	Elevation	Description
1	2,204,321.0430	482,158.2690	5,414.00	DOZER
2	2,203,661.3400	479,120.5940	5,132.70	94003
3	2,206,056.0830	479,594.8790	5,646.44	USMM207
8	2,205,665.3295	479,008.4403	5,440.06	478
9	2,205,539.9121	479,489.8871	5,509.94	477
10	2,204,949.2595	479,339.1511	5,332.00	476



LITHOLOGY

- PLAT/FLOW
- MASSIVE AT/FLOW
- LST-
- PMBX -
- TOS/BUD Epiclastics
- BMB - Rhyolitic Porphyry
- RHYOLITE - DOZER
- ALS - PHYLLITES

TEXTURES

- LITHIC FRAGMENTS
- CRYSTALS
- LAPILLI
- AMYGDULES
- SPHERULITE
- SHARDS

STRUCTURES

- BRECCIA
- FAULT
- CLAY OR GOUGE
- FRACTURE ZONE
- VEINS QTZ
- VEINLETS
- VEINS CALC

CONTACTS

- LOST, GRADATIONAL OR INFERRED
- 80 SHARP (WITH ANGLE TO CORE)
- WAVY
- ROUGH OR JAGGED
- PYRITIZATION
- CHLORITIZATION
- ARGILLIZATION
- SILICIFICATION
- GRAPHIC LOG

LOCATION ON GRID:	FINAL COLLAR COORDINATES	START	FINISH	LOGGED BY
	NORTH	HOLE TYPE	SURVEYED TO	
LAB	EAST			
JOB #	ELEV	BEARING	ANGLE	T. D.
DRILLING COMPANY	DRILLER			
The Rosebud Mining Company LLC		PAGE 1 OF	HOLE #	

Newmont Gold Core Form

Hole# RS-477-99
Logged by D.G. MacKerron
Date 10/29/99
Area North Area Turq x
Coords
Az/Incl S 30°E / -60
Total Depth
Contractor
Page 2 of

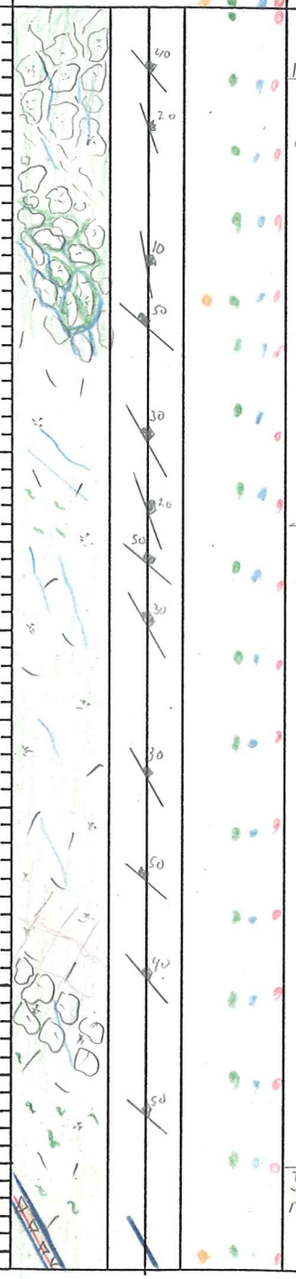
Footage	% Rec	RQD	Litho: Formation	Litho: Rock type	Litho: Color	Au oz/st	Ag oz/st	Graphic	Structure: Attitudes	Structure: fault	Structure: breccia	Structure: vein	Structure: gouge	Comments	Alteration: Silic	Alteration: argillic	Alteration: clay	Alteration: prop	Alteration: Sericite	Alteration: Chlorite	Met.: FEOX	Met.: CO3	Met.: Sulfide	Mineralogy: Pyrite	Mineralogy: Marcasite	Mineralogy: Calc/Dolo	Mineralogy: Clay
1740			Td	Rhy	Pal. Green Whit									1539.5 DOZER	0	0	0	0	0	1	0	0	0	1	0	1	0
1760																											
1780																											
1800														1817-1826 Fx zone													
1820									30																		
1840																											1 0
1860														1861-1883.5 Fx zone with white clay on high angle fx													1
1880																											0
1900																											1 0
1920																											1 0
1940																											1

Newmont Gold Core Form

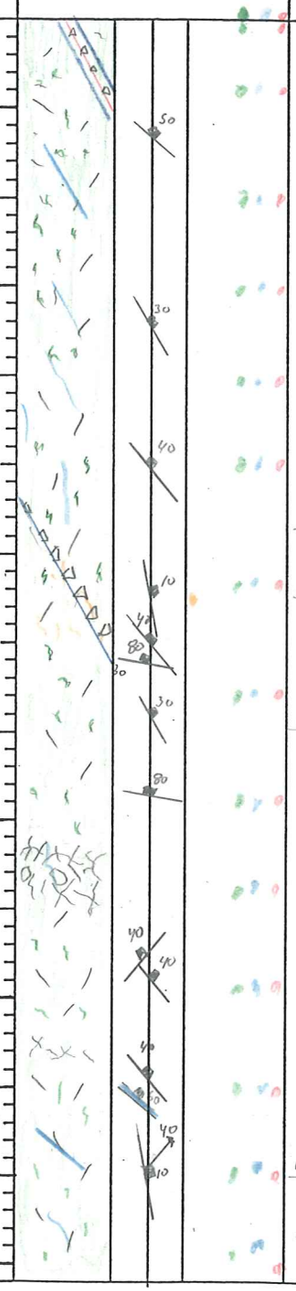
Hole# RS-477-99
Logged by D.G. Mackerrow
Date 10-27-99
Area North Area target
Coords
Az/Incl 530°E / -60
Total Depth
Contractor Longyear
Page 1 of

Footage	% Rec	RQD	Litho: Formation	Litho: Rock type	Litho: Color	Au oz/st	Ag oz/st	Graphic	Structure: Attitudes	Structure: fault	Structure: breccia	Structure: vein	Structure: gouge	Comments	Alteration: Silic	Alteration: argillic	Alteration: clay	Alteration: prop	Alteration: Sericite	Alteration: Chlorite	Met.: FEOX	Met.: CO3	Met.: Sulfide	Mineralogy: Pyrite	Mineralogy: Marcasite	Mineralogy: Calc/Dolo	Mineralogy: Clay
1540			Td	Rhy	Pale green white									1539.5 DOZER	0	0	0	0	0	1	0	0	0	1	0	1	0
														Collar depth is 1539.5													1
1560														Auto breccia of vesicular Dacite fine grained chlorite alteration dominate													0
1580																											1
1600																											0
1620																											
1640																											1 0
1660																											1 0
1680														1695-1700 Fx zone													1
1700																				2 1							0
1720																				2							
1740																				1						2 1	

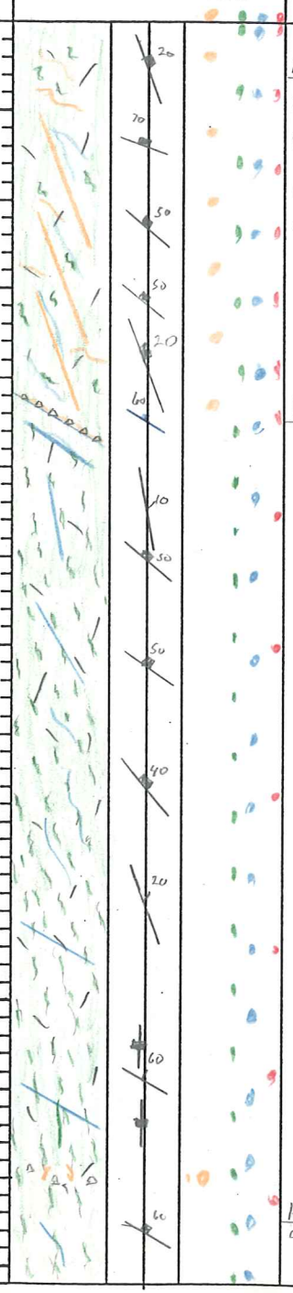
HOLE NUMBER _____ PAGE 4 OF _____

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
Td	R	1539.5 – 2004.7 DOZER Fine grained pale green white rhyolite flow 1778 Vesicle foliation is steep at 20° tca	1720 1730 1740 1750 1760 1770 1780 1790		1720 – 1737 Variable intensity auto breccia texture 1752 – 1757 Fracture zone with open space along 30° tca 1789.9 – 1790.9 30° tca Breccia zone MOSAIC INTENSITY	1736-1737 white clay on fractures 1760 – 177.5 Fine bleeding of disseminated pyrite from fracture locally generates a hatched pattern on core surface 1790 fracture surface in breccia dark grey from fine py	1720 1730 1737 1747.5 1757 1767.5 1773 1777.5	1730 1737 1747.5 1757 1767.5 1773 1777.5 1787.5				

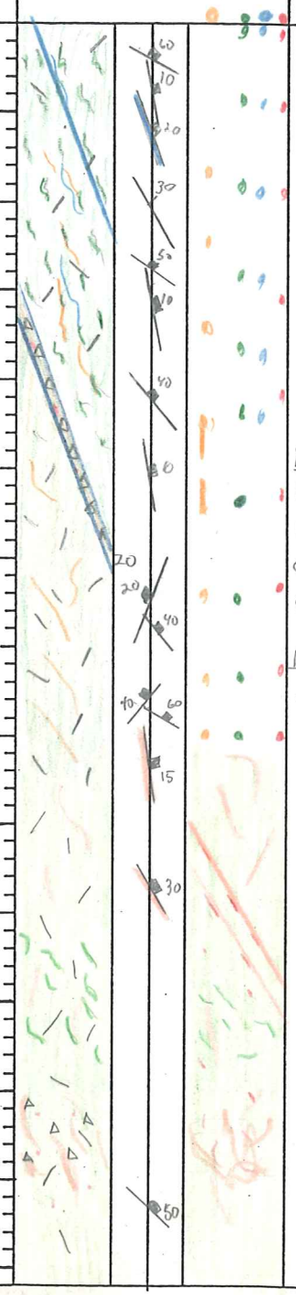
HOLE NUMBER RS- 477 -99 PAGE 5 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
Td	R	1839.5 – 2004.7 DOZER Fine grained rhyolite flow. Texture varies with thin elongated chloritized vesicle or auto breccias.	1790 1800 1810 1820 1830 1840 1850 1860		1819-1826 Fracture zone steep orientation cross cut by lower angle ones. 1819.6-1821 crackle breccia in fracture zone 1856 10° ten fracture with oblique slips at 40° to axis	Disseminate pyrite continues at ≈ 1% Chloritic alteration continues to tint rock pale green gray. Locally sulfides bleed from some fractures up to 1/4" 1819-1826 white clay traces on fractures	1787.5 1798 1808.5 1819 1826 1839.5 1850	1798 1808.5 1819 1826 1836 1839.5 1850 1860.5				
						1836-1839.5 Weak crackle breccia with hydrothermally altered clays						

HOLE NUMBER RS-477-99 PAGE 6 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
Td	R	1839.5 - 2004.7 DOZER Rhyolite flow continues as above Pim @ 1881 white clay on 200 tca fx 1884.5 Vesicle trains become very high angle at 200 tca. Trains are very well developed	1860 1870 1880 1890 1900 1910 1920 1930		1862.5 Fracture zone begins High angle 20° tca fractures with some cross cuts 1882.5 2" clay healed rubble breccia 60° tca 1924-1925 weak crackle bxs	1861-1884.5 white clay on fractures, increase clay is heavier on high angle fracture 1885 - Pyrite decrease and is found at its highest concentration on fractures. Pyrite increases again by 1950 1923 white clay on open fractures related to crackle bxs.	1860.5 1867.5 1873 1883.5 1894 1904.5 1915 1925.5	1867.5 1873 1883.5 1894 1904.5 1915 1925.5 1935				

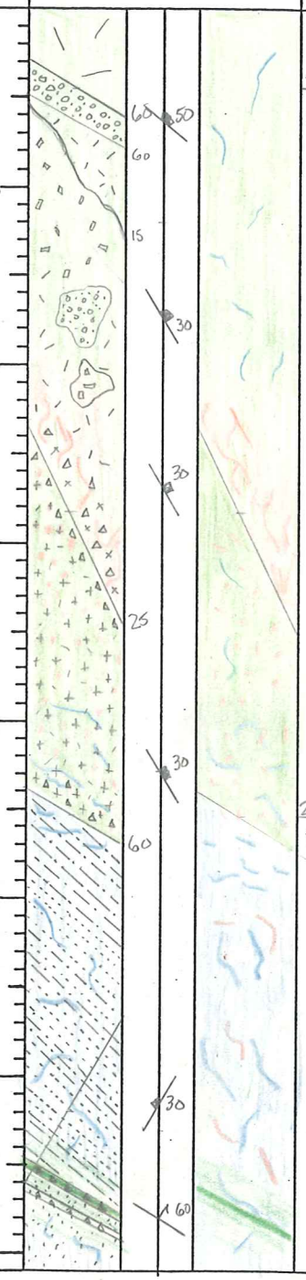
HOLE NUMBER RS-477-99 PAGE 7 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
Td	R	1539.5 – 2004.7 DOZER Fine grain rhyolite flow Elongated vesicles form steeply dipping trains Faint foliation to the flow was visible at 1941' at 30° tca	1930 1940 1950 1960 1970 1980 1990 2000		1952.6 – 1953.5 Mosaic breccia with dark pyrite on sharp upper surface. 1980 – 2000 frequency of joints decrease	1935.8 2" calcite vein 1952.6 – weak argillization starts at fault plane. Core develops a mottle surface appearance.

ANALYTICAL DATA

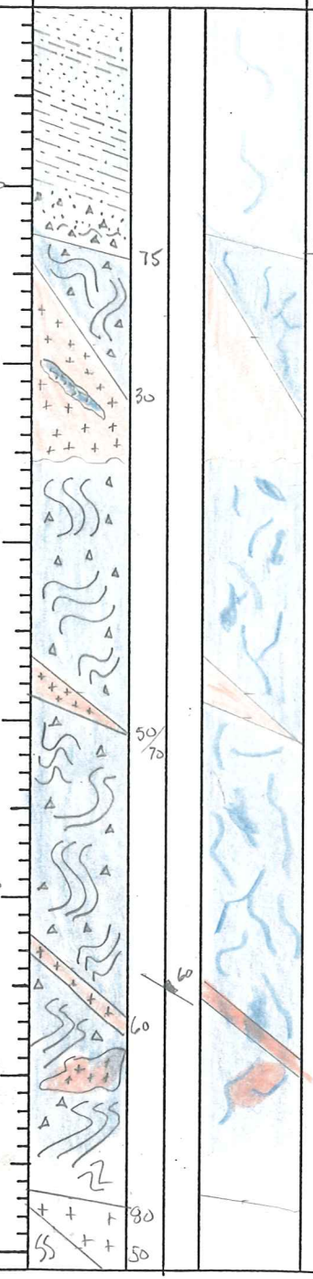
FROM	TO	W	Au	Ag	Au2
1925.5	1935				
1935	1945				
1945	1952.3				
1952.3	1955				
1955	1960.5				
1960.5	1965.5				
1965.5	1973				
1973	1980.5				
1980.5	1988				
1988	1991.5				
1991.5	1998.5				

HOLE NUMBER RS-477-99 PAGE 8 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
		1539.5 - 2004.7 Dozer Continues 2004.7 - TCS Epiclastic Sediments. Siltstones. Sandstones and Pebble conglomerates. Some interbedded mudstones. Core is a Pale to medium Green.	2010 2020		2004.7 - 2025.3 Some Joints 30-50° Some with white clay some with Calcite. Contacts are not distinct. Rock is brecciated incompletely Last 3' of zone has broken Core.	2004.7 - 2028.3 Weakly calcareous. Moderately propylitized. Increased amount of white clay at lower end of zone. Some white clay in open fractures. and core is broken and coated with clay. ± barite in white clay	1998.5	2004.7				
							2004.7	2012				
							2012	2018				
							2018	2025.3				
		2028.3 - 2045.3 Biotite rich intrusive. 5-7% biotite Medium to dark Green. 15-20% fine-grainded Phenocrysts Altered to white clay (Feldspars).	2030 2040			2028.3 - 2045.3 Moderate Propylitic alteration and weakly argillized. Lower 8' of unit is weakly calcareous.	2025.3	2028.3				
							2028.3	2033.5				
		2045.3 - 2083.6 Dark brown mottled with grey. mudstone or tuffaceous sediment? Interbedded with a fine Grained sandstone (Grey)	2050 2060 2070		2045.3 - 2083.6 Parts along bedding at 40-50°	2045.3 - 2083.6 Weakly calcareous, Some Calcite veins at 70°. Minor white clay.	2033.5	2045.3				
								2055				
								2062				
								2068.5				

HOLE NUMBER RS-477-99 PAGE 9 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		JCS continues				
		ALS	2083		2083.6 – 2147.7 Jointing / Parting at 50-60° along bedding in rock.	2083.6 – 2232 Weakly calcareous. abundant calcite in veins and masses. Variable amounts of syngenetic Pyrite as masses or disseminated xtals. Intrusives are weakly argillized.
			2090			
			2100			
			2110			
			2120			
			2130			
			2147			



ANALYTICAL DATA					
FROM	TO	W	Au	Ag	Au2
	2079				
	2083.6				
	2087.2				
	2095.7				
	2100				
	2108.5				
	2119				
	2124				
	2128.8				
	2137				

HOLE NUMBER RS-477-99 PAGE 10 OF

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
		ALS Continues			2141.7 - 2191 Intense breccia zone. Broken core to milled breccia with ALS matrix. Intrusives in zone are also brecciated. Minor white clay			2141.7				
		SRF	2150					2150				
								2158				
			2160					2161				
								2169				
			2170									
						2183.5 - 2191 fractures have a light coating of white clay		2175.2				
			2180					2183.5				
								2191				
			2190									
			2200					2202.5				
			2210									

HOLE NUMBER _____ PAGE 11 OF _____

LITH.	OX/RED.	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2
		ALS Continues	2220, 2230					2213, 2223, 2232				
		TD = 2232										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 10/26/99 LOGGED BY: D.G. MacKerrow PAGE 1 OF ____

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
1539.5	1541.5	75	90	30										
1541.5	1542.5	50	100	0										
1542.5	1544.5	100	110	70										
1544.5	1545	0	100	0										
1545	1548.5	117	137	114										
1548.5	1557	82	99	66										
1557	1565.5	74	100	41										
1565.5	1576	100	100	72										
1576	1584	85	100	60										
1584	1592.5	89	100	55										
1592.5	1593.5	0	100	50										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 10/26/99 LOGGED BY: D.G. Mackerron PAGE 2 OF ____

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY /FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
1593.5	1599	36	100	0										
1599	1599.5	0	100	0										
1599.5	1602	80	100	55										
1602	1610	100	100	83										
1610	1620.5	98	100	72										
1620.5	1631	93	100	72										
1631	1641.5	100	102	90										
1641.5	1652	93	100	54										
1652	1656.5	100	100	71										
1656.5	1667	100	100	80										
1667	1677.5	100	100	73										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 10/26/99 LOGGED BY: D.G. MacTerrow PAGE 3 OF

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
1677.5	1678.5	70	100	0										
1678.5	1688	91	95	58										
1688	1692	0	100	0										
1692	1700	36	100	33										
1700	1710	100	100	74										
1710	1720	100	101	93										
1720	1730	99	97	76										
1730	1737	81	100	64										
1737	1747.5	83	100	62										
1747.5	1754.5	84	100	41										
1754.5	1755	60	100	0										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 10-28-99 LOGGED BY: D.G. MacKerrow PAGE 4 OF ____

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
1755	1757	95	100	30										
1757	1767.5	97	100	63										
1767.5	1777.5	57	100	25										
1777.5	1787.5	100	101	97										
1787.5	1798	100	100	72										
1798	1808.5	90	95	69										
1808.5	1819	100	102	74										
1819	1829.5	42	100	36										
1829.5	1839.5	91	104	60										
1839.5	1850	100	98	85										
1850	1860.5	100	100	80										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 10-29-99 LOGGED BY: D.G. Mackerrow PAGE 5 OF ____

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
1860.5	1865.5	80	100	26										
1865.5	1867.5	60	160	0										
1867.5	1873	40	91	67										
1873	1883.5	71	100	35										
1883.5	1894	93	100	75										
1894	1904.5	100	100	50										
1904.5	1915	100	100	76										
1915	1925.5	100	100	78										
1925.5	1935	100	95	67										
1935	1936	0	130	60										
1936	1945	100	100	50										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 10-31-99 LOGGED BY: D.G. Mulherrow PAGE 6 OF ____

DRILL RUN		SOLID CORE	TOTAL CORE	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO	RECOVERY (%)	RECOVERY (%)		DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
1945	1955	50	103	25										
1955	1965.5	66	100	60										
	1971	75	100	25										
	1980.5	90	98	35										
	1988	100	100	95										
	1998.5	90	100	95										
	2008	95	95	70										
	2018	100	100	65										
	2028	75	100	65										
	2038.5	95	99	95										
	2048.5	90	95	70										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 11/20/99 LOGGED BY: PTR PAGE 7 OF ____

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
2048.5	2058.5	90	100	15										
2058.5	2068.5	90	100	15										
2068.5	2079	95	98	15										
2079	2089.5	80	90	20										
2089.5	2100	90	100	16										
2100	2108.5	75	100	0										
2108.5	2119	90	98	10										
2119	2129	80	90	10										
2129	2139.5	90	100	5										
2139.5	2150	75	100	Ø										
2150	2160.5	75	100	Ø										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-477-99 DATE: 11/20/99 LOGGED BY: PR PAGE 8 OF

DRILL RUN		SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH		FRACTURE DATA				DENSITY DATA			
FROM	TO				DOWNHOLE DEPTH	POINT LOAD INDEX (psi)	FRACTURE DENSITY/FT.	AVG. ANGLE TO C.A.	ROUGHNESS	INFILL	DOWNHOLE DEPTH	SAMPLE WEIGHT (g)	DISPLACEMENT (cc)	DENSITY (g/cc)
2160.5	2171	60	100	Ø										
2171	2181.5	60	90	Ø										
2185.1	2183.5	20	80	Ø										
2183.5	2193.5	60	100	10										
2193.5	2202.5	75	100	20										
2202.5	2213	95	100	Ø										
2213	2223	90	95	Ø										
2223	2232	90	95	35										

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RS-477
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DATE
LOGGED BY KDA
TOTAL DEPTH 1540' RDC Pre-collar

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH S30°E
INCLINATION -55°

AREA Northwest Gregson
DRILLING CO. Ekund
RIG TYPE RD-10
HOLE SIZE
DOWN HOLE SURVEY BY welfine

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MASSIVE	QUARTZ	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	K-SPAR	ALUNITE	POTASSIC %	OXIDATION 5%	15%	+25%	VIENING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AS-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	OXIDE	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
0–100		Tb	Badger Formation - Volcanic Conglomerate w/ sub-rounded clasts supported in volcanic matrix - Clast appear to be dominated by Tc. Fe-mag Flow.	M	Porph.																																					

5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

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DRILL LOG

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LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MASSIVE	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VEINING %	VEINING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AG-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	AU	AG
105		Tb	SAA	m	P																																				
110				m	P																																				
115				m	P																																				
120		Tb mud	Barren Formation. consists of Dominantly A Sandy mud stone (SS) ft. Barren) as described By Peter Rozowski.	S	N-P																																				
125				S																																					
130				S																																					
135				S																																					
140				S																																					
145				S																																					
150		Tc Fe-MAG	Tc-Fe-Mag Flow: Slightly porphyritic w/ abundant Hematite replaced hornblende micro-phenocrysts. some interbedded Auto Breccia zones.	MH	SP																																				
155																																									
160																																									
165																																									
170																																									
175																																									
180																																									
185																																									
190																																									
195																																									
200																																									

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																	MINERALIZATION									METALLURGY				ANALYTICAL DATA				
						SILICIFICATION					ARGILLIC				PROPYLITIC %		POTASSIC %		OXIDATION			VIENING	SULFIDES			PY	CPY	MAR	AS-SUL	STIBNITE	BARITE	OXIDE	SULF	CARBON	MOLYBDE	FROM	TO	W	AU	AG
						5%	15%	+25%	MAGS	QUARTZ	5%	15%	+25%	TYPE	CALCITE	CHLORITE	K-SPAR	KAOLINITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%										
205		TC-Fe Mag	SAA	MH	SP																																				
210																																									
215																																									
220																																									
225																																									
230																																									
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275																																									
280																																									
285																																									
290																																									
295																																									
300																																									

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RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																	MINERALIZATION									METALLURGY				ANALYTICAL DATA				
						SILICIFICATION					ARGILLIC				PROPYLITIC %		POTASSIC %		OXIDATION			VIENING	SULFIDES			PY	CPY	MAR	AG-SULF	SILBNITE	BARITE	OXIDE	SULF	OPEOX	MOCURE	FROM	TO	W	Au	Ag
						5%	15%	+25%	MATRIX %	CLASTS %	5%	15%	+25%	TYPE	CHLORITE	CALCITE	EX-SPAR	ALUNITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%										
305		TC Fe-Mag	SAA	MH	SP																																				
310																																									
315																																									
320																																									
325																																									
330																																									
335																																									
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385																																									
390																																									
395																																									
400																																									

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FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																	MINERALIZATION									METALLURGY				ANALYTICAL DATA				
						SILICIFICATION					ARGILLIC				PROPYLITIC %		POTASSIC %		OXIDATION			VIENING	SULFIDES			PY	CPY	MAR	X-SULF	SULFATE	BARITE	OXIDE	SULF	CARBON	MOISTURE	FROM	TO	W	Au	Ag
						5%	15%	+25%	MAGS %	QUARTS %	5%	15%	+25%	TYPE	CHLORITE	CALCITE	K-SPAR	ALUNITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%										
405		TC Fe-Mag	SAA	MH	SP																																				
410																																									
415																																									
420																																									
425																																									
430																																									
435																																									
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490																																									
495																																									
500																																									

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RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MAGNET %	SILICIFICATION QUARTZ %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SLF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	OPEROX	MOCURE	ANALYTICAL DATA: FROM	TO	W	AU	AG
505		TC Fe-MAG	SAA - containing ≈ 2% Limonite coated fragments	M	SP						X								X																						
510				MH																																					
515				MH																																					
520		TC Fe-MAG	Possible stockwork w/ bleaching ± SiO2 + sulfides	MS-M	SP	X					X			Bleaching					X			1	Cocoa SiO2 PY	X			X	?												
525				MS-M	SP	X					X								X			1		X			X	?												
530		TC Fe-MAG	SAA	MH	SP																																				
535																																									
540																																									
545																																									
550																																									
555																																									
560																																									
565																																									
570																																									
575																																									
580																																									
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590																																									
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FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																	MINERALIZATION									METALLURGY				ANALYTICAL DATA				
						SILICIFICATION					ARGILLIC				PROPYLITIC %	POTASSIC %		OXIDATION			VIENING		SULFIDES			PY	CPY	MAR	AC-SUL	SULFIDE	BARITE	OXIDE	SULF	CARBON	MOCURE	FROM	TO	W	AU	AG
						5%	15%	+25%	MAGR	QUARTS	5%	15%	+25%	TYPE	CHLORITE	CALCITE	K-SPAR	HALOITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%										
605		TC Fe-Mag	SAA	MIT	SP																																				
610																																									
615																																									
620																																									
625																																									
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675																																									
680																																									
685																																									
690			APPEARS to be AN INCREASE IN plag & SANIDINE ? phenos		P																																				
695																																									
700																																									

Hecla MINING COMPANY

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FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION																	MINERALIZATION									METALLURGY				ANALYTICAL DATA				
						SILICIFICATION					ARGILLIC				PROPYLITIC %		POTASSIC %		OXIDATION			VIENING		SULFIDES			PY	CPY	MAR	AS-SUL	STIBNITE	BARITE	OXIDE	SULF	CARBON	MOISURE	FROM	TO	W	Au	Ag
						5%	15%	+25%	MASS	QUARTS	5%	15%	+25%	TYPE	CHLORITE	CALCITE	K-SPAR	ALUNITE	5%	15%	+25%	%	TYPE	5%	15%	+25%	%	%	%	%	%	%										
705		TC Fe-MAS	SAA	M4	SP																																				
710																																									
715																																									
720																																									
725																																									
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795																																									
800																																									

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FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MACRO	SILICIFICATION CLASTS	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDENITE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
805		TC Fe-MAG ?	Fe-mag Auto Bx - INCREASED: Bleaching (oxidation) due to INCREASED sulfide content.	M	SP						X													X			X														
810						X					X								X					X			X													
815						X					X								X					X			X													
820						X					X								X					X			X													
825						X					X								X					X			X													
830						X					X								X					X			X													
835						X					X								X					X			X													
840						X					X								X					X			X													
845						X					X								X					X			X													
850						X					X								X					X			X													
855						X					X								X					X			X													
860						X					X								X					X			X													
865						X					X													X			X													
870			Possible structure - silica veinlets w/ pyrite + argillic alteration	MS-H		X						X					+																							
875				S-MH		X						X					+																							
880		TC Fe-Mag	Fe-mag flow ? Auto Bx	M																																				
885																																								
890																																								
895																																								
900																																								

Hecla MINING COMPANY

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DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MASSIVE	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AS-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	AU	AG
905		Fe MAG	SAA	MH	SP																																				
910				MH																																					
915		TC FeMAG	SAA - Bleached	M-MH	SP	Y					X													X			Y														
920						Y					X													Y			X														
925						Y					X													X			X														
930						Y					X													X			X														
935						Y					X													X			Y														
940						Y					X													X			Y														
945						Y					X													X			X														
950						Y					X													X			X														
955		TC FeMAG		MH	SP																																				
960																																									
965																																									
970			Bleached / possible structure,	MS-M	SP	Y					X													X			X														
975		TC FeMAG		MH	SP																																				
980																																									
985																																									
990																																									
995																																									
1000																																									

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EASTING
ELEVATION
AZIMUTH
INCLINATION

AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MASSIVE	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AS-SULF %	SULBITE %	BARITE %	METALLURGY: OXIDE	SULF	OXIDOX	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	As
1005		TC Fe-Mag	SAA.	M	SP																																				
1010				M																																					
1015				M																				X																	
1020		TC Fe-Mag		M-MS	SP	X					X													X																	
1025				M-MS		X					X													X																	
1030						X					X													X																	
1035		TC Fe-Mag		M	SP																																				
1040																																									
1045		TC Fe-Mag		M-MH	SP	X					X														X		X	+/-													
1050						X					X														X		X	+/-													
1055						X					X															X	X	+/-													
1060						X					X															X	X	+/-													
1065						X					X															X	X	+/-													
1070						X					X															X	X	+/-													
1075						X					X															X	X	+/-													
1080						X					X														X		X	+/-													
1085			CAVE FAULT. Strong Bleaching +S.Qz	MH-H				X			X	X												X		X		+/-													
1090							X					X												X		X		+/-													
1095		TD.	Fg. Aphanitic Porce. Formation			X					X	X												X		X		+/-													
1100							X				X													X		X															

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MASSIVE	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AS-SULF %	SULFOSALT %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1105		TD	Dacite Formation - Fine-Grained, Aphanitic, Rhyolitic flows.	Mh	Fg Aph	x					x													x			x														
1110						x					x													x			x														
1115						x					x													x			x														
1120						x					x													x			y														
1125						x					x													x			x														
1130						x					x													x			y														
1135						x					x													x			x														
1140						x					x													x			x														
1145						x					x														x		x		+/-												
1150						y					y													x			y														
1155						x					y													y			x														
1160						y					y													y			y														
1165						y					x													y			y														
1170						y					y													y			y														
1175						y					x													y			y														
1180						y					y													y			y														
1185						y					x													y			y														
1190						y					y													y			y														
1195						y					y													y			y														
1200						y					y													y			y														

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ROSEBUD PROJECT
DRILL LOG

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MASSIVE	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AS-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1205		TD	SAA	M/H	Fg-Am	X					X													X			X														
1210						X					X													X			X														
1215						X					X													X			X														
1220						X					X													X			X														
1225						X					X													X			X														
1230						X					X													X			X														
1235						X					X													X			X														
1240						X					X													X			X														
1245						X					X													X			X														
1250						X					X													X			X														
1255						X					X													X	X		X		X/-												
1260						X					X													X			X														
1265						X					X													X			X														
1270						X					X													X			X														
1275						X					X													X			X														
1280						X					X													X			X														
1285						X					X													X			X														
1290						X					X													X			X														
1295						X					X													X			X														
1300						X					X													X			X														

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DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MATRIX	QUARTZ	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	KUNITE	OXIDATION 5%	15%	+25%	VEINING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AS-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1305		TD	SAA	MH	Fg AgH	X					X													X			X														
1310						X					X													X			X														
1315						X					X													X			X														
1320						X					X													X			X														
1325						X					X													X			X														
1330		TD Ves.	Slightly Vesicular Lower Fm. Vesicles Are Filled W/ LT. Green Calcite Clay ± SiO2	MH	Ves	X					X				X																										
1335						X					X				X																										
1340						X					X				X																										
1345						X					X				X																										
1350						X					X				X																										
1355						X					X				X																										
1360						X					X				X																										
1365						X					X				X																										
1370						X					X				X																										
1375						X					X				X																										
1380						X					X				X																										
1385						X					X				X																										
1390						X					X				X																										
1395						X					X				X																										
1400						X					X				X																										

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RIG TYPE
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FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION CLASTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AG-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	AU	AG
1405		Td ves	SAA	MH	vesicular																																				
1410																																									
1415																																									
1420																																									
1425																																									
1430																																									
1435																																									
1440																																									
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1480																																									
1485																																									
1490																																									
1495																																									
1500																																									

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ROSEBUD PROJECT
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FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MAGR	QUARTS	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	K-SPAR	ALUNITE	POTASSIC %	OXIDATION 5%	15%	+25%	VIENING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AS-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	OXIDE	MIXTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1505		TD JES	SAA	MH	VESE	X					X				X										X			X														
1510						X					X				X										X			X														
1515						X					X				X										X			X														
1520						X					X				X										X			X														
1525						X					X				X										X			X														
1530						X					X				X										X			X														
1535						X					X				X										X			X														
1540						X					X				X										X			X														

Newmont Gold Core Form

Hole# RS-477-99
Logged by D.G. Mackerron
Date 10/31/99
Area North Area Target
Coords
Az/Incl 530°E/-60
Total Depth
Contractor Longyear

Footage	% Rec	RQD	Litho: Formation	Litho: Rock type	Litho: Color	Au oz/st	Ag oz/st	Graphic	Structure: Attitudes	Structure: fault	Structure: breccia	Structure: vein	Structure: gouge	Comments	Alteration: Silic	Alteration: argillic	Alteration: clay	Alteration: prop	Alteration: Sericite	Alteration: Chlorite	Met.: FEOX	Met.: CO3	Mineralogy: Sulfide	Mineralogy: Pyrite	Mineralogy: Marcasite	Mineralogy: Calc/Dolo	Mineralogy: Clay
1940			Td	Rhy	Pale grn wh.t									1539.5 DOZER	0	0	0	0	0	1	0	0	1	1	0	1	1
																											0
														Fun H 1952.3 – 1953		1											1
1960									2v					1883.5 – 1952.3 Pyrite at ≤ 5%													
1980																											
2000																											
2020																											
2040																											
2060																											
2080																											
2100																											
2120																											
2140																											

INSPECTORATE

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840 Greg Street
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Tel:775-359-6311
Fax: 775-359-2944

20-Dec-99

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ROSEBUD MINING COMPANY
P.O. BOX 2610
58 MILES WEST OF
WINNEMUCCA, NV 89446

Certificate of Analysis

Received: 30-Nov-99 06:54

Attn: Kurt Allen
Project: RS-477-99

PO #: Ref: 99-46-06

Job: 993831R

Status: Final

Drill Core

Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 1539.5-1545	0.002	0.034
RS-477-99 1545-1548.5	0.004	0.037
RS-477-99 1548.5-1557	0.002	0.004
RS-477-99 1557-1561.5	0.002	0.003
RS-477-99 1561.5-1566.1	0.001	<0.100
RS-477-99 1566.1-1576	0.001	<0.100
RS-477-99 1576-1584	0.001	<0.100
RS-477-99 1584-1591.5	0.001	0.013
RS-477-99 1591.5-1599.5	0.006	0.030
RS-477-99 1599.5-1605	0.000	<0.100
RS-477-99 1605-1610	0.001	0.001
RS-477-99 1610-1620.5	0.001	<0.100
RS-477-99 1620.5-1631	0.001	<0.100
RS-477-99 1631-1641.5	0.001	0.033
RS-477-99 1641.5-1647	0.000	0.004
RS-477-99 1647-1650.5	0.001	0.002
RS-477-99 1650.5-1656.5	0.001	<0.100
RS-477-99 1656.5-1667	0.000	<0.100
RS-477-99 1667-1677.5	0.001	0.007
RS-477-99 1677.5-1686.5	0.001	0.004

ROSEBUD MINING COMPANY
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Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 1686.5-1689.6	0.001	0.004
RS-477-99 1689.6-1695	0.001	0.007
RS-477-99 1695-1700	0.001	0.004
RS-477-99 1700-1710	0.001	0.001
RS-477-99 1710-1720	0.001	0.007
RS-477-99 1720-1730	0.001	0.003
RS-477-99 1730-1737	0.014	0.018
RS-477-99 1737-1747.5	0.001	<0.100
RS-477-99 1747.5-1757	0.001	0.128
RS-477-99 1757-1767.5	0.001	0.009
RS-477-99 1767.5-1773	0.001	0.010
RS-477-99 1773-1777.5	0.001	0.007
RS-477-99 1777.5-1787.5	0.000	<0.100
RS-477-99 1787.5-1798	0.001	0.013
RS-477-99 1798-1808.5	0.001	0.010
RS-477-99 1808.5-1819	0.001	0.012
RS-477-99 1819-1826	0.001	0.030
RS-477-99 1826-1836	0.000	0.007
RS-477-99 1836-1839.5	0.001	0.020
RS-477-99 1839.5-1850	0.001	0.010

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Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 1850-1860.5	0.000	0.001
RS-477-99 1860.5-1867.5	0.000	<0.100
RS-477-99 1867.5-1873	0.000	0.005
RS-477-99 1873-1883.5	0.000	<0.100
RS-477-99 1883.5-1894	0.000	<0.100
RS-477-99 1894-1904.5	0.000	0.004
RS-477-99 1904.5-1915	0.000	<0.100
RS-477-99 1915-1925.5	0.000	0.040
RS-477-99 1925.5-1935	0.000	<0.100
RS-477-99 1935-1945	0.000	0.002
RS-477-99 1945-1952.3	0.000	0.014
RS-477-99 1952.3-1955	0.001	0.009
RS-477-99 1955-1960.5	0.001	0.011
RS-477-99 1960.5-1965.5	0.001	0.007
RS-477-99 1965.5-1973	0.001	0.210
RS-477-99 1973-1980.5	0.001	0.013
RS-477-99 1980.5-1988	0.000	0.001
RS-477-99 1988-1991.5	0.000	0.003
RS-477-99 1991.5-1998.5	0.001	0.004
RS-477-99 1998.5-2004.7	0.000	<0.100

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Drill Core

Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 2004.7-2012	0.000	0.009
RS-477-99 2012-2018	0.001	0.009
RS-477-99 2018-2025.3	0.001	0.003
RS-477-99 2025.3-2028.3	0.000	0.006
RS-477-99 2025.3-2038.5	0.000	0.005
RS-477-99 2038.5-2045.3	0.001	0.021
RS-477-99 2045.3-2055	0.000	0.008
RS-477-99 2055-2062	0.000	0.006
RS-477-99 2062-2068.5	0.000	0.007
RS-477-99 2068.5-2079	0.001	0.009
RS-477-99 2079-2083.6	0.000	0.019
RS-477-99 2083.6-2087.2	0.001	0.038
RS-477-99 2087.2-2095.7	0.001	0.008
RS-477-99 2095.7-2100	0.001	0.054
RS-477-99 2100-2108.5	0.001	0.062
RS-477-99 2108.5-2119	0.000	0.009
RS-477-99 2119-2124	0.000	0.021
RS-477-99 2124-2128.8	0.000	0.005
RS-477-99 2128.8-2137	0.001	0.018
RS-477-99 2137-2141.7	0.000	0.003

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PO #: Ref: 99-46-06

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Drill Core

Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 2141.7-2150	0.001	0.007
RS-477-99 2150-2158	0.000	0.021
RS-477-99 2158-2161	0.000	0.002
RS-477-99 2161-2169	0.000	0.012
RS-477-99 2169-2175.2	0.001	<0.100
RS-477-99 2175.2-2183.5	0.000	<0.100
RS-477-99 2183.5-2191	0.000	0.002
RS-477-99 2191-2202.5	0.000	<0.100
RS-477-99 2202.5-2213	0.000	0.009
RS-477-99 2213-2223	0.000	0.020
RS-477-99 2213-2223	0.000	0.080
RS-477-99 2223-2232	0.001	0.002

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Attn: Kurt Allen
Project: RS-477-99

PO #: Ref: 99-46-06

Job: 993831R

Status: Final

Drill Core

Sample Id	Ag ICP ppm	Al ICP %	As ICP ppm	B ICP ppm	Ba ICP ppm	Bi ICP ppm	Ca ICP %	Cd ICP ppm	Co ICP ppm	Cr ICP ppm
RS-477-99 1539.5-1591.5	<0.1	0.42	8	15	46	<1	0.46	<0.5	<1	10
RS-477-99 1591.5-1641.5	<0.1	0.41	4	16	55	<1	0.41	0.9	<1	10
RS-477-99 1641.5-1689.6	<0.1	0.48	5	19	20	<1	0.58	0.9	<1	10
RS-477-99 1689.6-1737	<0.1	0.41	5	17	38	<1	0.43	0.7	<1	12
RS-477-99 1737-1787.5	<0.1	0.41	6	18	20	<1	0.42	0.8	<1	9
RS-477-99 1787.5-1839.5	<0.1	0.47	8	19	18	<1	0.34	0.6	<1	10
RS-477-99 1839.5-1894	<0.1	0.50	3	19	43	<1	0.28	0.7	<1	12
RS-477-99 1894-1952.3	<0.1	0.42	<2	19	63	2	0.41	0.9	<1	12
RS-477-99 1952.3-2004.7	<0.1	0.47	4	19	99	<1	0.35	0.7	<1	6
RS-477-99 2004.7-2038.5	0.1	0.55	<2	23	360	<1	0.88	0.6	8	12
RS-477-99 2038.5-2095.7	0.2	1.08	47	39	111	4	1.30	2.2	16	30
RS-477-99 2095.7-2141.7	1.1	0.52	62	32	84	2	1.88	10.7	10	17
RS-477-99 2141.7-2191	0.3	0.42	59	33	74	4	2.39	3.9	13	20
RS-477-99 2191-2232	0.7	0.09	26	25	71	5	<0.01	2.0	8	8

Sample Id	Cu ICP ppm	Fe ICP %	Hg HYG ppb	K ICP %	La ICP ppm	Mg ICP %	Mn ICP ppm	Mo ICP ppm	Na ICP %	Ni ICP ppm
RS-477-99 1539.5-1591.5	4	1.03	45	0.55	47	0.03	406	1	0.73	2

INSPECTORATE

INSPECTORATE AMERICA CORPORATION
840 Greg Street
Sparks, Nevada 89431
Tel:775-359-6311
Fax: 775-359-2944

20-Dec-99

ROSEBUD MINING COMPANY
P.O. BOX 2610
58 MILES WEST OF
WINNEMUCCA, NV 89446

Certificate of Analysis

Attn: Kurt Allen
Project: RS-477-99

Received: 30-Nov-99 06:54
PO #: Ref: 99-46-06

Job: 993831R

Status: Final

Drill Core

Sample Id	Cu ICP ppm	Fe ICP %	Hg HYG ppb	K ICP %	La ICP ppm	Mg ICP %	Mn ICP ppm	Mo ICP ppm	Na ICP %	Ni ICP ppm
RS-477-99 1591.5-1641.5	3	1.22	36	0.53	49	0.03	363	2	0.80	2
RS-477-99 1641.5-1689.6	3	1.38	45	0.55	50	0.05	489	1	0.82	2
RS-477-99 1689.6-1737	4	1.18	57	0.56	51	0.03	400	2	0.78	2
RS-477-99 1737-1787.5	6	1.19	24	0.55	51	0.03	416	3	0.79	4
RS-477-99 1787.5-1839.5	4	1.34	28	0.60	51	0.03	346	1	0.76	3
RS-477-99 1839.5-1894	5	1.44	24	0.56	51	0.03	321	4	0.68	7
RS-477-99 1894-1952.3	4	1.36	36	0.50	51	0.03	436	3	0.79	5
RS-477-99 1952.3-2004.7	3	1.42	24	0.51	48	0.05	368	<1	0.92	1
RS-477-99 2004.7-2038.5	22	1.79	40	0.27	12	0.20	220	<1	0.10	32
RS-477-99 2038.5-2095.7	53	3.40	49	0.18	7	0.67	362	2	1.75	48
RS-477-99 2095.7-2141.7	67	2.68	57	0.15	<2	0.44	245	26	11.09	47
RS-477-99 2141.7-2191	43	2.89	57	0.14	2	0.62	231	19	4.12	59
RS-477-99 2191-2232	40	2.09	93	0.09	2	0.56	147	33	2.53	63

Sample Id	P ICP ppm	Pb ICP ppm	Sb ICP ppm	Se ICP ppm	Sr ICP ppm	Ti ICP %	Tl ICP ppm	V ICP ppm	W ICP ppm	Zn ICP ppm
RS-477-99 1539.5-1591.5	57	23	<2	<0.5	106	<0.01	<0.5	<2	<1	66
RS-477-99 1591.5-1641.5	45	24	<2	<0.5	98	<0.01	<0.5	<2	<1	77

INSPECTORATE

INSPECTORATE AMERICA CORPORATION
840 Greg Street
Sparks, Nevada 89431
Tel:775-359-6311
Fax: 775-359-2944

20-Dec-99

ROSEBUD MINING COMPANY
P.O. BOX 2610
58 MILES WEST OF
WINNEMUCCA, NV 89446

Certificate of Analysis

Received: 30-Nov-99 06:54

Attn: Kurt Allen
Project: RS-477-99

PO #: Ref: 99-46-06

Job: 993831R

Status: Final

Drill Core

Sample Id	P ICP ppm	Pb ICP ppm	Sb ICP ppm	Se ICP ppm	Sr ICP ppm	Ti ICP %	Tl ICP ppm	V ICP ppm	W ICP ppm	Zn ICP ppm
RS-477-99 1641.5-1689.6	49	24	<2	<0.5	135	<0.01	<0.5	<2	<1	79
RS-477-99 1689.6-1737	58	23	<2	<0.5	118	<0.01	<0.5	<2	<1	78
RS-477-99 1737-1787.5	49	25	<2	<0.5	129	<0.01	<0.5	<2	<1	82
RS-477-99 1787.5-1839.5	56	24	<2	<0.5	140	<0.01	<0.5	<2	<1	81
RS-477-99 1839.5-1894	48	25	<2	<0.5	119	<0.01	<0.5	<2	<1	78
RS-477-99 1894-1952.3	62	23	<2	<0.5	118	<0.01	<0.5	<2	<1	79
RS-477-99 1952.3-2004.7	55	28	<2	<0.5	191	<0.01	<0.5	<2	<1	84
RS-477-99 2004.7-2038.5	422	24	<2	<0.5	387	0.01	<0.5	14	<1	45
RS-477-99 2038.5-2095.7	532	32	3	<0.5	518	<0.01	<0.5	45	<1	133
RS-477-99 2095.7-2141.7	461	33	5	1.9	462	<0.01	<0.5	21	<1	625
RS-477-99 2141.7-2191	586	26	4	<0.5	546	<0.01	<0.5	11	<1	242
RS-477-99 2191-2232	631	23	3	<0.5	831	<0.01	<0.5	5	<1	152

RS-477-99

Depth From	To	Interval	Au	Ag	ICP	Composite Interval	Sample No.
1539.5	1545	5.5	X	X			1
1545	1548.5	3.5	X	X			2
1548.5	1557	8.5	X	X			3
1557	1561.5	4.5	X	X			4
1561.5	1566.1	4.6	X	X			5
1566.1	1576	9.9	X	X			6
1576	1584	8	X	X			7
1584	1591.5	7.5	X	X	X	52	8
1591.5	1599.5	8	X	X			9
1599.5	1605	5.5	X	X			10
1605	1610	5	X	X			11
1610	1620.5	10.5	X	X			12
1620.5	1631	10.5	X	X			13
1631	1641.5	10.5	X	X	X	50	14
1641.5	1647	5.5	X	X			15
1647	1650.5	3.5	X	X			16
1650.5	1656.5	6	X	X			17
1656.5	1667	10.5	X	X			18
1667	1677.5	10.5	X	X			19
1677.5	1686.5	9	X	X			20
1686.5	1689.6	3.1	X	X	X	48.1	21
1689.6	1695	5.4	X	X			22
1695	1700	5	X	X			23
1700	1710	10	X	X			24
1710	1720	10	X	X			25
1720	1730	10	X	X			26
1730	1737	7	X	X	X	47.4	27
1737	1747.5	10.5	X	X			28
1747.5	1757	9.5	X	X			29
1757	1767.5	10.5	X	X			30
1767.5	1773	5.5	X	X			31
1773	1777.5	4.5	X	X			32
1777.5	1787.5	10	X	X	X	50.5	33
1787.5	1798	10.5	X	X			34
1798	1808.5	10.5	X	X			35
1808.5	1819	10.5	X	X			36
1819	1826	7	X	X			37
1826	1836	10	X	X			38
1836	1839.5	3.5	X	X	X	52	39
1839.5	1850	10.5	X	X			40
1850	1860.5	10.5	X	X			41
1860.5	1867.5	7	X	X			42
1867.5	1873	5.5	X	X			43
1873	1883.5	10.5	X	X			44
1883.5	1894	10.5	X	X	X	54.5	45
1894	1904.5	10.5	X	X			46

1904.5	1915	10.5	X	X			47
1915	1925.5	10.5	X	X			48
1925.5	1935	9.5	X	X			49
1935	1945	10	X	X			50
1945	1952.3	7.3	X	X	X	58.3	51
1952.3	1955	2.7	X	X			52
1955	1960.5	5.5	X	X			53
1960.5	1965.5	5	X	X			54
1965.5	1973	7.5	X	X			55
1973	1980.5	7.5	X	X			56
1980.5	1988	7.5	X	X			57
1988	1991.5	3.5	X	X			58
1991.5	1998.5	7	X	X			59
1998.5	2004.7	6.2	X	X	X	52.4	60
2004.7	2012	7.3	X	X			61
2012	2018	6	X	X			62
2018	2025.3	7.3	X	X			63
2025.3	2028.3	3	X	X			64
2028.3	2038.5	10.2	X	X	X	33.8	65
2038.5	2045.3	6.8	X	X			66
2045.3	2055	9.7	X	X			67
2055	2062	7	X	X			68
2062	2068.5	6.5	X	X			69
2068.5	2079	10.5	X	X			70
2079	2083.6	4.6	X	X			71
2083.6	2087.2	3.6	X	X			72
2087.2	2095.7	8.5	X	X	X	57.2	73
2095.7	2100	4.3	X	X			74
2100	2108.5	8.5	X	X			75
2108.5	2119	10.5	X	X			76
2119	2124	5	X	X			77
2124	2128.8	4.8	X	X			78
2128.8	2137	8.2	X	X			79
2137	2141.7	4.7	X	X	X	46	80
2141.7	2150	8.3	X	X			81
2150	2158	8	X	X			82
2158	2161	3	X	X			83
2161	2169	8	X	X			84
2169	2175.2	6.2	X	X			85
2175.2	2183.5	8.3	X	X			86
2183.5	2191	7.5	X	X	X	49.3	87
2191	2202.5	11.5	X	X			88
2202.5	2213	10.5	X	X			89
2213	2223	10	X	X			90
2223	2232	9	X	X	X	41	91

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES

840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 359-2944

Certificate of Analysis

DATE: Friday, October 29, 1999

JOB NO: 99-36-16

CLIENT: Hecla Mining Co. (Rosebud Mine)
P.O. Box 2610
Winnecmucca, NV 89446 US

INVOICE NO: 33000937

CLIENT ORDER NO: RS-477 0-950'

REPORT ON: 190 Drill Cutting

SUBMITTED BY: Kurt Allen

DATE RECIEVED: Friday, October 15, 1999

ANALYSES: Gold, Silver

ANALYTICAL METHODS: AQR-AA, Fire Assay

REMARKS:

CC: RMG File

E-MAILED TO:

All values are reported in parts per million unless specified otherwise. A minus sign (–) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.

ND=None Detected 1 ppm=0.0001% Troy oz./ton=34.286 ppm 1 ppm=0.0292 Troy oz./ton

The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of rocks or minerals collected by the prospective investor or by a qualified person selected by him.

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 0'-5'	-0.005	-0.003
RS-477 5'-10'	-0.005	-0.003
RS-477 10'-15'	-0.005	-0.003
RS-477 15'-20'	-0.005	-0.003
RS-477 20'-25'	-0.005	-0.003
RS-477 25'-30'	-0.005	-0.003
RS-477 30'-35'	-0.005	-0.003
RS-477 35'-40'	-0.005	-0.003
RS-477 40'-45'	-0.005	-0.003
RS-477 45'-50'	-0.005	-0.003
RS-477 50'-55'	-0.005	-0.003
RS-477 55'-60'	-0.005	-0.003
RS-477 60'-65'	-0.005	-0.003
RS-477 65'-70'	-0.005	0.003
RS-477 70'-75'	-0.005	0.006
RS-477 75'-80'	-0.005	0.003
RS-477 80'-85'	-0.005	-0.003
RS-477 85'-90'	-0.005	0.003
RS-477 90'-95'	-0.005	-0.003
RS-477 95'-100'	-0.005	-0.003
RS-477 100'-105'	-0.005	-0.003
RS-477 105'-110'	-0.005	0.003
RS-477 110'-115'	-0.005	-0.003
RS-477 115'-120'	-0.005	0.003

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 120'-125'	-0.005	0.003
RS-477 125'-130'	-0.005	-0.003
RS-477 130'-135'	-0.005	-0.003
RS-477 135'-140'	-0.005	0.006
RS-477 140'-145'	-0.005	-0.003
RS-477 145'-150'	-0.005	-0.003
RS-477 150'-155'	-0.005	-0.003
RS-477 155'-160'	-0.005	-0.003
RS-477 160'-165'	-0.005	-0.003
RS-477 165'-170'	-0.005	-0.003
RS-477 170'-175'	-0.005	0.003
RS-477 175'-180'	-0.005	0.003
RS-477 180'-185'	-0.005	0.003
RS-477 185'-190'	-0.005	0.003
RS-477 190'-195'	-0.005	-0.003
RS-477 195'-200'	-0.005	-0.003
RS-477 200'-205'	-0.005	0.003
RS-477 205'-210'	-0.005	0.006
RS-477 210'-215'	-0.005	-0.003
RS-477 215'-220'	-0.005	-0.003
RS-477 220'-225'	-0.005	-0.003
RS-477 225'-230'	-0.005	-0.003
RS-477 230'-235'	-0.005	0.003
RS-477 235'-240'	-0.005	-0.003

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 240'-245'	-0.005	-0.003
RS-477 245'-250'	-0.005	-0.003
RS-477 250'-255'	-0.005	0.006
RS-477 255'-260'	-0.005	0.006
RS-477 260'-265'	-0.005	0.015
RS-477 265'-270'	-0.005	-0.003
RS-477 270'-275'	-0.005	-0.003
RS-477 275'-280'	-0.005	0.006
RS-477 280'-285'	-0.005	-0.003
RS-477 285'-290'	-0.005	0.012
RS-477 290'-295'	-0.005	0.003
RS-477 295'-300'	-0.005	-0.003
RS-477 300'-305'	-0.005	0.009
RS-477 305'-310'	-0.005	-0.003
RS-477 310'-315'	-0.005	-0.003
RS-477 315'-320'	-0.005	0.003
RS-477 320'-325'	-0.005	0.003
RS-477 325'-330'	-0.005	0.003
RS-477 330'-335'	-0.005	0.003
RS-477 335'-340'	-0.005	-0.003
RS-477 340'-345'	-0.005	-0.003
RS-477 345'-350'	-0.005	-0.003
RS-477 350'-355'	-0.005	-0.003
RS-477 355'-360'	-0.005	-0.003

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 360'-365'	-0.005	-0.003
RS-477 365'-370'	-0.005	-0.003
RS-477 370'-375'	-0.005	-0.003
RS-477 375'-380'	-0.005	-0.003
RS-477 380'-385'	-0.005	-0.003
RS-477 385'-390'	-0.005	-0.003
RS-477 390'-395'	-0.005	-0.003
RS-477 395'-400'	-0.005	-0.003
RS-477 400'-405'	-0.005	-0.003
RS-477 405'-410'	-0.005	-0.003
RS-477 410'-415'	-0.005	-0.003
RS-477 415'-420'	-0.005	-0.003
RS-477 420'-425'	-0.005	-0.003
RS-477 425'-430'	-0.005	-0.003
RS-477 430'-435'	-0.005	-0.003
RS-477 435'-440'	-0.005	-0.003
RS-477 440'-445'	-0.005	0.003
RS-477 445'-450'	-0.005	-0.003
RS-477 450'-455'	-0.005	0.003
RS-477 455'-460'	-0.005	0.003
RS-477 460'-465'	-0.005	0.003
RS-477 465'-470'	-0.005	-0.003
RS-477 470'-475'	-0.005	-0.003
RS-477 475'-480'	-0.005	0.003

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 480'-485'	-0.005	-0.003
RS-477 485'-490'	-0.005	0.003
RS-477 490'-495'	-0.005	0.003
RS-477 495'-500'	-0.005	-0.003
RS-477 500'-505'	-0.005	0.055
RS-477 505'-510'	-0.005	0.032
RS-477 510'-515'	-0.005	0.009
RS-477 515'-520'	-0.005	0.003
RS-477 520'-525'	-0.005	0.003
RS-477 525'-530'	-0.005	0.003
RS-477 530'-535'	-0.005	0.003
RS-477 535'-540'	-0.005	-0.003
RS-477 540'-545'	-0.005	-0.003
RS-477 545'-550'	-0.005	0.009
RS-477 550'-555'	-0.005	0.003
RS-477 555'-560'	-0.005	0.003
RS-477 560'-565'	-0.005	0.003
RS-477 565'-570'	-0.005	0.006
RS-477 570'-575'	-0.005	0.003
RS-477 575'-580'	-0.005	-0.003
RS-477 580'-585'	-0.005	-0.003
RS-477 585'-590'	-0.005	0.009
RS-477 590'-595'	-0.005	-0.003
RS-477 595'-600'	-0.005	0.003

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 600'-605'	-0.005	0.018
RS-477 605'-610'	-0.005	0.003
RS-477 610'-615'	-0.005	-0.003
RS-477 615'-620'	-0.005	0.003
RS-477 620'-625'	-0.005	-0.003
RS-477 625'-630'	-0.005	-0.003
RS-477 630'-635'	-0.005	-0.003
RS-477 635'-640'	-0.005	-0.003
RS-477 640'-645'	-0.005	-0.003
RS-477 645'-650'	-0.005	-0.003
RS-477 650'-655'	-0.005	-0.003
RS-477 655'-660'	-0.005	-0.003
RS-477 660'-665'	-0.005	-0.003
RS-477 665'-670'	-0.005	0.006
RS-477 670'-675'	-0.005	0.003
RS-477 675'-680'	-0.005	0.009
RS-477 680'-685'	-0.005	-0.003
RS-477 685'-690'	-0.005	0.003
RS-477 690'-695'	-0.005	-0.003
RS-477 695'-700'	-0.005	-0.003
RS-477 700'-705'	-0.005	0.006
RS-477 705'-710'	-0.005	0.003
RS-477 710'-715'	-0.005	-0.003
RS-477 715'-720'	-0.005	-0.003

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 720'-725'	-0.005	-0.003
RS-477 725'-730'	-0.005	-0.003
RS-477 730'-735'	-0.005	-0.003
RS-477 735'-740'	-0.005	-0.003
RS-477 740'-745'	-0.005	-0.003
RS-477 745'-750'	-0.005	-0.003
RS-477 750'-755'	-0.005	-0.003
RS-477 755'-760'	-0.005	0.003
RS-477 760'-765'	-0.005	-0.003
RS-477 765'-770'	-0.005	-0.003
RS-477 770'-775'	-0.005	0.003
RS-477 775'-780'	-0.005	-0.003
RS-477 780'-785'	-0.005	-0.003
RS-477 785'-790'	-0.005	0.032
RS-477 790'-795'	-0.005	-0.003
RS-477 795'-800'	0.018	-0.003
RS-477 800'-805'	-0.005	-0.003
RS-477 805'-810'	-0.005	0.003
RS-477 810'-815'	-0.005	-0.003
RS-477 815'-820'	-0.005	-0.003
RS-477 820'-825'	-0.005	-0.003
RS-477 825'-830'	-0.005	0.003
RS-477 830'-835'	-0.005	-0.003
RS-477 835'-840'	0.005	0.006

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 840'-845'	0.005	0.009
RS-477 845'-850'	-0.005	0.003
RS-477 850'-855'	-0.005	-0.003
RS-477 855'-860'	-0.005	0.003
RS-477 860'-865'	-0.005	0.003
RS-477 865'-870'	-0.005	0.006
RS-477 870'-875'	-0.005	0.006
RS-477 875'-880'	-0.005	0.003
RS-477 880'-885'	-0.005	0.003
RS-477 885'-890'	-0.005	0.003
RS-477 890'-895'	-0.005	0.003
RS-477 895'-900'	-0.005	0.003
RS-477 900'-905'	-0.005	-0.003
RS-477 905'-910'	-0.005	0.003
RS-477 910'-915'	-0.005	0.003
RS-477 915'-920'	-0.005	-0.003
RS-477 920'-925'	-0.005	0.003
RS-477 925'-930'	-0.005	0.003
RS-477 930'-935'	-0.005	0.003
RS-477 935'-940'	-0.005	-0.003
RS-477 940'-945'	-0.005	0.009
RS-477 945'-950'	-0.005	0.006

Friday, October 29, 1999

By Kristin Meyer

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES

840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 359-2944

Certificate of Analysis

DATE: Sunday, November 07, 1999

JOB NO: 99-36-17

CLIENT: Hecla Mining Co. (Rosebud Mine)
P.O. Box 2610
Winnecmucca, NV 89446 US

INVOICE NO: 33100057

CLIENT ORDER NO: RS-477 950' - 1540' TD

REPORT ON: 119 Drill Cutting

SUBMITTED BY: Kurt Allen

DATE RECIEVED: Friday, October 15, 1999

ANALYSES: Gold, Silver

ANALYTICAL METHODS: AA, Fire/AA

REMARKS:

CC: RMG File

E-MAILED TO:

All values are reported in parts per million unless specified otherwise. A minus sign (–) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.

ND=None Detected 1 ppm=0.0001% Troy oz./ton=34.286 ppm 1 ppm=0.0292 Troy oz./ton

The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of rocks or minerals collected by the prospective investor or by a qualified person selected by him.

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 950'-955'	0.001	0.006
RS-477 955'-960'	-0.001	0.001
RS-477 960'-965'	-0.001	0.007
RS-477 965'-970'	0.001	0.009
RS-477 970'-975'	-0.001	0.009
RS-477 975'-980'	-0.001	0.004
RS-477 980'-985'	-0.001	0.007
RS-477 985'-990'	-0.001	0.006
RS-477 990'-995'	-0.001	0.008
RS-477 995'-1000'	-0.001	0.008
RS-477 1000'-1005'	-0.001	0.010
RS-477 1005'-1010'	0.003	0.010
RS-477 1010'-1015'	-0.001	0.006
RS-477 1015'-1020'	0.001	0.006
RS-477 1020'-1025'	0.002	0.004
RS-477 1025'-1030'	0.003	0.010
RS-477 1030'-1035'	0.001	0.005
RS-477 1035'-1040'	-0.001	0.006
RS-477 1040'-1045'	0.001	0.005
RS-477 1045'-1050'	0.006	0.008
RS-477 1050'-1055'	0.004	0.009
RS-477 1055'-1060'	0.005	0.011
RS-477 1060'-1065'	0.002	0.005
RS-477 1065'-1070'	0.001	0.005

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 1070'-1075'	0.002	0.007
RS-477 1075'-1080'	0.003	0.008
RS-477 1080'-1085'	0.003	0.021
RS-477 1085'-1090'	0.002	0.016
RS-477 1090'-1095'	0.006	0.024
RS-477 1095'-1100'	0.003	0.056
RS-477 1100'-1105'	0.001	0.017
RS-477 1105'-1110'	0.002	0.021
RS-477 1110'-1115'	0.002	0.027
RS-477 1115'-1120'	0.002	0.032
RS-477 1120'-1125'	0.002	0.022
RS-477 1125'-1130'	0.002	0.016
RS-477 1130'-1135'	0.007	0.047
RS-477 1135'-1140'	0.002	0.012
RS-477 1140'-1145'	0.004	0.015
RS-477 1145'-1150'	0.002	0.013
RS-477 1150'-1155'	0.003	0.019
RS-477 1155'-1160'	0.001	0.020
RS-477 1160'-1165'	0.001	0.021
RS-477 1165'-1170'	0.003	0.023
RS-477 1170'-1175'	0.001	0.020
RS-477 1175'-1180'	0.001	0.023
RS-477 1180'-1185'	0.001	0.017
RS-477 1185'-1190'	0.001	0.019

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 1190'-1195'	0.002	0.014
RS-477 1195'-1200'	0.001	0.012
RS-477 1200'-1205'	0.017	0.023
RS-477 1205'-1210'	0.002	0.024
RS-477 1210'-1215'	0.001	0.013
RS-477 1215'-1220'	0.001	0.012
RS-477 1220'-1225'	0.001	0.009
RS-477 1225'-1230'	0.001	0.010
RS-477 1230'-1235'	-0.001	0.010
RS-477 1235'-1240'	-0.001	0.007
RS-477 1240'-1245'	0.001	0.010
RS-477 1245'-1250'	0.001	0.010
RS-477 1250'-1255'	0.001	0.008
RS-477 1255'-1260'	-0.001	0.007
RS-477 1260'-1265'	-0.001	0.010
RS-477 1265'-1270'	0.033	0.080
RS-477 1270'-1275'	0.022	0.028
RS-477 1275'-1280'	0.002	0.021
RS-477 1280'-1285'	0.001	0.005
RS-477 1285'-1290'	0.006	0.018
RS-477 1290'-1295'	0.002	0.008
RS-477 1295'-1300'	0.028	0.047
RS-477 1300'-1305'	0.003	0.016
RS-477 1305'-1310'	0.002	0.019

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 1310'-1315'	-0.001	0.011
RS-477 1315'-1320'	-0.001	0.004
RS-477 1320'-1325'	0.001	0.009
RS-477 1325'-1330'	0.001	0.007
RS-477 1330'-1335'	-0.001	0.007
RS-477 1335'-1340'	-0.001	0.009
RS-477 1340'-1345'	-0.001	0.006
RS-477 1345'-1350'	0.003	0.005
RS-477 1350'-1355'	-0.001	0.006
RS-477 1355'-1360'	-0.001	0.006
RS-477 1360'-1365'	-0.001	0.007
RS-477 1365'-1370'	0.001	0.010
RS-477 1370'-1375'	0.001	0.006
RS-477 1375'-1380'	-0.001	0.009
RS-477 1380'-1385'	-0.001	0.007
RS-477 1385'-1390'	-0.001	0.008
RS-477 1390'-1395'	-0.001	0.004
RS-477 1395'-1400'	0.008	0.020
RS-477 1400'-1405'	-0.001	0.011
RS-477 1405'-1410'	0.001	0.008
RS-477 1410'-1415'	-0.001	0.008
RS-477 1415'-1420'	-0.001	0.001
RS-477 1420'-1425'	0.001	0.008
RS-477 1425'-1430'	-0.001	0.007

SAMPLE NO	oz/ton Gold	oz/ton Silver
RS-477 1430'-1435'	-0.001	0.005
RS-477 1435'-1440'	0.001	0.007
RS-477 1440'-1445'	0.001	0.009
RS-477 1445'-1450'	0.001	0.011
RS-477 1450'-1455'	-0.001	0.002
RS-477 1455'-1460'	-0.001	0.004
RS-477 1460'-1465'	-0.001	0.005
RS-477 1465'-1470'	0.001	0.011
RS-477 1470'-1475'	-0.001	0.003
RS-477 1475'-1480'	-0.001	0.009
RS-477 1480'-1485'	-0.001	0.005
RS-477 1485'-1490'	-0.001	0.005
RS-477 1490'-1495'	-0.001	0.004
RS-477 1495'-1500'	-0.001	0.005
RS-477 1500'-1505'	0.001	0.005
RS-477 1505'-1510'	0.001	0.006
RS-477 1510'-1515'	-0.001	0.004
RS-477 1515'-1520'	-0.001	0.001
RS-477 1520'-1525'	-0.001	0.001
RS-477 1525'-1530'	0.001	0.009
RS-477 1530'-1535'	0.001	0.005
RS-477 1535'-1540'	0.001	0.007
STD-68649	0.152	0.859

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20-Dec-99

ROSEBUD MINING COMPANY
P.O. BOX 2610
58 MILES WEST OF
WINNEMUCCA, NV 89446

Certificate of Analysis

Attn: Kurt Allen
Project: RS-477-99

Received: 30-Nov-99 06:54
PO #: Ref: 99-46-06

Job: 993831R

Status: Final

Drill Core

Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 1539.5-1545	0.002	0.034
RS-477-99 1545-1548.5	0.004	0.037
RS-477-99 1548.5-1557	0.002	0.004
RS-477-99 1557-1561.5	0.002	0.003
RS-477-99 1561.5-1566.1	0.001	<0.100
RS-477-99 1566.1-1576	0.001	<0.100
RS-477-99 1576-1584	0.001	<0.100
RS-477-99 1584-1591.5	0.001	0.013
RS-477-99 1591.5-1599.5	0.006	0.030
RS-477-99 1599.5-1605	0.000	<0.100
RS-477-99 1605-1610	0.001	0.001
RS-477-99 1610-1620.5	0.001	<0.100
RS-477-99 1620.5-1631	0.001	<0.100
RS-477-99 1631-1641.5	0.001	0.033
RS-477-99 1641.5-1647	0.000	0.004
RS-477-99 1647-1650.5	0.001	0.002
RS-477-99 1650.5-1656.5	0.001	<0.100
RS-477-99 1656.5-1667	0.000	<0.100
RS-477-99 1667-1677.5	0.001	0.007
RS-477-99 1677.5-1686.5	0.001	0.004

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RS-477-99 1686.5-1689.6	0.001	0.004
RS-477-99 1689.6-1695	0.001	0.007
RS-477-99 1695-1700	0.001	0.004
RS-477-99 1700-1710	0.001	0.001
RS-477-99 1710-1720	0.001	0.007
RS-477-99 1720-1730	0.001	0.003
RS-477-99 1730-1737	0.014	0.018
RS-477-99 1737-1747.5	0.001	<0.100
RS-477-99 1747.5-1757	0.001	0.128
RS-477-99 1757-1767.5	0.001	0.009
RS-477-99 1767.5-1773	0.001	0.010
RS-477-99 1773-1777.5	0.001	0.007
RS-477-99 1777.5-1787.5	0.000	<0.100
RS-477-99 1787.5-1798	0.001	0.013
RS-477-99 1798-1808.5	0.001	0.010
RS-477-99 1808.5-1819	0.001	0.012
RS-477-99 1819-1826	0.001	0.030
RS-477-99 1826-1836	0.000	0.007
RS-477-99 1836-1839.5	0.001	0.020
RS-477-99 1839.5-1850	0.001	0.010

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Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 1850-1860.5	0.000	0.001
RS-477-99 1860.5-1867.5	0.000	<0.100
RS-477-99 1867.5-1873	0.000	0.005
RS-477-99 1873-1883.5	0.000	<0.100
RS-477-99 1883.5-1894	0.000	<0.100
RS-477-99 1894-1904.5	0.000	0.004
RS-477-99 1904.5-1915	0.000	<0.100
RS-477-99 1915-1925.5	0.000	0.040
RS-477-99 1925.5-1935	0.000	<0.100
RS-477-99 1935-1945	0.000	0.002
RS-477-99 1945-1952.3	0.000	0.014
RS-477-99 1952.3-1955	0.001	0.009
RS-477-99 1955-1960.5	0.001	0.011
RS-477-99 1960.5-1965.5	0.001	0.007
RS-477-99 1965.5-1973	0.001	0.210
RS-477-99 1973-1980.5	0.001	0.013
RS-477-99 1980.5-1988	0.000	0.001
RS-477-99 1988-1991.5	0.000	0.003
RS-477-99 1991.5-1998.5	0.001	0.004
RS-477-99 1998.5-2004.7	0.000	<0.100

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Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 2004.7-2012	0.000	0.009
RS-477-99 2012-2018	0.001	0.009
RS-477-99 2018-2025.3	0.001	0.003
RS-477-99 2025.3-2028.3	0.000	0.006
RS-477-99 2025.3-2038.5	0.000	0.005
RS-477-99 2038.5-2045.3	0.001	0.021
RS-477-99 2045.3-2055	0.000	0.008
RS-477-99 2055-2062	0.000	0.006
RS-477-99 2062-2068.5	0.000	0.007
RS-477-99 2068.5-2079	0.001	0.009
RS-477-99 2079-2083.6	0.000	0.019
RS-477-99 2083.6-2087.2	0.001	0.038
RS-477-99 2087.2-2095.7	0.001	0.008
RS-477-99 2095.7-2100	0.001	0.054
RS-477-99 2100-2108.5	0.001	0.062
RS-477-99 2108.5-2119	0.000	0.009
RS-477-99 2119-2124	0.000	0.021
RS-477-99 2124-2128.8	0.000	0.005
RS-477-99 2128.8-2137	0.001	0.018
RS-477-99 2137-2141.7	0.000	0.003

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Sample Id	Au FA/AA/AAS oz/ton	Ag AA oz/ton
RS-477-99 2141.7-2150	0.001	0.007
RS-477-99 2150-2158	0.000	0.021
RS-477-99 2158-2161	0.000	0.002
RS-477-99 2161-2169	0.000	0.012
RS-477-99 2169-2175.2	0.001	<0.100
RS-477-99 2175.2-2183.5	0.000	<0.100
RS-477-99 2183.5-2191	0.000	0.002
RS-477-99 2191-2202.5	0.000	<0.100
RS-477-99 2202.5-2213	0.000	0.009
RS-477-99 2213-2223	0.000	0.020
RS-477-99 2213-2223	0.000	0.080
RS-477-99 2223-2232	0.001	0.002

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Sample Id	Ag ICP ppm	Al ICP %	As ICP ppm	B ICP ppm	Ba ICP ppm	Bi ICP ppm	Ca ICP %	Cd ICP ppm	Co ICP ppm	Cr ICP ppm
RS-477-99 1539.5-1591.5	<0.1	0.42	8	15	46	<1	0.46	<0.5	<1	10
RS-477-99 1591.5-1641.5	<0.1	0.41	4	16	55	<1	0.41	0.9	<1	10
RS-477-99 1641.5-1689.6	<0.1	0.48	5	19	20	<1	0.58	0.9	<1	10
RS-477-99 1689.6-1737	<0.1	0.41	5	17	38	<1	0.43	0.7	<1	12
RS-477-99 1737-1787.5	<0.1	0.41	6	18	20	<1	0.42	0.8	<1	9
RS-477-99 1787.5-1839.5	<0.1	0.47	8	19	18	<1	0.34	0.6	<1	10
RS-477-99 1839.5-1894	<0.1	0.50	3	19	43	<1	0.28	0.7	<1	12
RS-477-99 1894-1952.3	<0.1	0.42	<2	19	63	2	0.41	0.9	<1	12
RS-477-99 1952.3-2004.7	<0.1	0.47	4	19	99	<1	0.35	0.7	<1	6
RS-477-99 2004.7-2038.5	0.1	0.55	<2	23	360	<1	0.88	0.6	8	12
RS-477-99 2038.5-2095.7	0.2	1.08	47	39	111	4	1.30	2.2	16	30
RS-477-99 2095.7-2141.7	1.1	0.52	62	32	84	2	1.88	10.7	10	17
RS-477-99 2141.7-2191	0.3	0.42	59	33	74	4	2.39	3.9	13	20
RS-477-99 2191-2232	0.7	0.09	26	25	71	5	<0.01	2.0	8	8

Sample Id	Cu ICP ppm	Fe ICP %	Hg HYG ppb	K ICP %	La ICP ppm	Mg ICP %	Mn ICP ppm	Mo ICP ppm	Na ICP %	Ni ICP ppm
RS-477-99 1539.5-1591.5	4	1.03	45	0.55	47	0.03	406	1	0.73	2

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RS-477-99 1591.5-1641.5	3	1.22	36	0.53	49	0.03	363	2	0.80	2
RS-477-99 1641.5-1689.6	3	1.38	45	0.55	50	0.05	489	1	0.82	2
RS-477-99 1689.6-1737	4	1.18	57	0.56	51	0.03	400	2	0.78	2
RS-477-99 1737-1787.5	6	1.19	24	0.55	51	0.03	416	3	0.79	4
RS-477-99 1787.5-1839.5	4	1.34	28	0.60	51	0.03	346	1	0.76	3
RS-477-99 1839.5-1894	5	1.44	24	0.56	51	0.03	321	4	0.68	7
RS-477-99 1894-1952.3	4	1.36	36	0.50	51	0.03	436	3	0.79	5
RS-477-99 1952.3-2004.7	3	1.42	24	0.51	48	0.05	368	<1	0.92	1
RS-477-99 2004.7-2038.5	22	1.79	40	0.27	12	0.20	220	<1	0.10	32
RS-477-99 2038.5-2095.7	53	3.40	49	0.18	7	0.67	362	2	1.75	48
RS-477-99 2095.7-2141.7	67	2.68	57	0.15	<2	0.44	245	26	11.09	47
RS-477-99 2141.7-2191	43	2.89	57	0.14	2	0.62	231	19	4.12	59
RS-477-99 2191-2232	40	2.09	93	0.09	2	0.56	147	33	2.53	63

Sample Id	P ICP ppm	Pb ICP ppm	Sb ICP ppm	Se ICP ppm	Sr ICP ppm	Ti ICP %	Tl ICP ppm	V ICP ppm	W ICP ppm	Zn ICP ppm
RS-477-99 1539.5-1591.5	57	23	<2	<0.5	106	<0.01	<0.5	<2	<1	66
RS-477-99 1591.5-1641.5	45	24	<2	<0.5	98	<0.01	<0.5	<2	<1	77

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Sample Id	P ICP ppm	Pb ICP ppm	Sb ICP ppm	Se ICP ppm	Sr ICP ppm	Ti ICP %	Tl ICP ppm	V ICP ppm	W ICP ppm	Zn ICP ppm
RS-477-99 1641.5-1689.6	49	24	<2	<0.5	135	<0.01	<0.5	<2	<1	79
RS-477-99 1689.6-1737	58	23	<2	<0.5	118	<0.01	<0.5	<2	<1	78
RS-477-99 1737-1787.5	49	25	<2	<0.5	129	<0.01	<0.5	<2	<1	82
RS-477-99 1787.5-1839.5	56	24	<2	<0.5	140	<0.01	<0.5	<2	<1	81
RS-477-99 1839.5-1894	48	25	<2	<0.5	119	<0.01	<0.5	<2	<1	78
RS-477-99 1894-1952.3	62	23	<2	<0.5	118	<0.01	<0.5	<2	<1	79
RS-477-99 1952.3-2004.7	55	28	<2	<0.5	191	<0.01	<0.5	<2	<1	84
RS-477-99 2004.7-2038.5	422	24	<2	<0.5	387	0.01	<0.5	14	<1	45
RS-477-99 2038.5-2095.7	532	32	3	<0.5	518	<0.01	<0.5	45	<1	133
RS-477-99 2095.7-2141.7	461	33	5	1.9	462	<0.01	<0.5	21	<1	625
RS-477-99 2141.7-2191	586	26	4	<0.5	546	<0.01	<0.5	11	<1	242
RS-477-99 2191-2232	631	23	3	<0.5	831	<0.01	<0.5	5	<1	152

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Project: RS-477-99

Received: 30-Nov-99 06:54
PO #: Ref: 99-46-06

Job: 993831R

Status: Final

Abbreviations:

Parameters:

Au	: Gold
Ag	: Silver
Al	: Aluminum
As	: Arsenic
B	: Boron
Ba	: Barium
Bi	: Bismuth
Ca	: Calcium
Cd	: Cadmium
Co	: Cobalt
Cr	: Chromium
Cu	: Copper
Fe	: Iron
Hg	: Mercury
K	: Potassium
La	: Lanthanum
Mg	: Magnesium
Mn	: Manganese
Mo	: Molybdenum
Na	: Sodium
Ni	: Nickel
P	: Phosporus
Pb	: Lead

INSPECTORATE

INSPECTORATE AMERICA CORPORATION
840 Greg Street
Sparks, Nevada 89431
Tel:775-359-6311
Fax: 775-359-2944

20-Dec-99

ROSEBUD MINING COMPANY
P.O. BOX 2610
58 MILES WEST OF
WINNEMUCCA, NV 89446

Certificate of Analysis

Attn: Kurt Allen
Received: 30-Nov-99 06:54
Project: RS-477-99
PO #: Ref: 99-46-06

Job: 993831R
Status: Final

Sb	: Antimony
Se	: Selenium
Sr	: Strontium
Ti	: Titanium
Tl	: Thallium
V	: Vanadium
W	: Tungsten
Zn	: Zinc

Methods:

FA/AA/AAS	: Fire Assay/Atomic Absorption Finish
AA	: Atomic Absorption
ICP	: Inductively Coupled Plasma
HYG	: Hydride Generation

Units:

oz/ton	: ounces per ton
ppm	: Parts per million
%	: percent
ppb	: Parts per billion

Quality codes:

<	: Less than

INSPECTORATE

INSPECTORATE AMERICA CORPORATION
840 Greg Street
Sparks, Nevada 89431
Tel:775-359-6311
Fax: 775-359-2944

20-Dec-99

ROSEBUD MINING COMPANY
P.O. BOX 2610
58 MILES WEST OF
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Certificate of Analysis

Attn: Kurt Allen
Project: RS-477-99

Received: 30-Nov-99 06:54
PO #: Ref: 99-46-06

Job: 993831R

Status: Final

The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geologic materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

Job approved by:

Signed:

.....

Dave Francisco
Laboratory Manager

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* HECLA MINING COMPANY *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-477 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/20/99

SURVEY ENGINEER: REID/THORSEN

GYRO REFERENCE BEARING: TRUE NORTH

TIE-ON COORDINATES AT: 0 M.D.
TAKEN FROM: COLLAR

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 251'

********** DEPTH MEASURED IN FEET *******
****

COMMENTS: ** BOART LONGYEAR **
*** MARTIN NIEMI ***

PROJECTED F/2180' T/2200'.

*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *

****
COMPANY REPRESENTATIVE
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311

WELL NAME: RS-477 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISPLACEMENT DISP.	STATION DISPLACEMENT DIRECTION
0.0	0.00	0.00	0.000	-55.85	150.55	0.00 N	0.00 E	0.00		0.00	AT 000.00
50.0	41.54	25.10	12.032	-56.50	150.68	24.25 S	13.66 E	1.31	0.65	27.83	AT 150.61
100.0	83.51	49.57	23.860	-57.65	150.92	47.97 S	26.92 E	2.31	1.16	55.01	AT 150.71
150.0	125.71	73.59	35.735	-57.52	151.68	71.48 S	39.79 E	0.86	0.43	81.81	AT 150.90
200.0	168.12	97.26	47.632	-58.49	151.69	94.81 S	52.35 E	1.94	0.97	108.30	AT 151.09
250.0	210.91	120.35	59.278	-59.23	151.85	117.59 S	64.58 E	1.49	0.74	134.16	AT 151.22
300.0	253.87	143.20	70.796	-59.20	151.65	140.13 S	76.70 E	0.21	0.11	159.75	AT 151.31
350.0	296.87	165.94	82.362	-59.45	152.28	162.64 S	88.69 E	0.81	0.41	185.25	AT 151.40
400.0	340.11	188.21	93.938	-60.27	152.64	184.90 S	100.29 E	1.68	0.84	210.35	AT 151.52
450.0	383.64	210.06	105.236	-60.79	152.04	206.69 S	111.71 E	1.20	0.60	234.95	AT 151.61
500.0	427.42	231.58	116.216	-61.42	152.02	228.03 S	123.04 E	1.26	0.63	259.11	AT 151.65
550.0	471.47	252.59	127.069	-62.13	152.63	248.97 S	134.03 E	1.53	0.77	282.75	AT 151.71
600.0	515.80	272.97	138.006	-62.76	153.82	269.62 S	144.45 E	1.67	0.84	305.87	AT 151.82
650.0	560.35	292.79	149.086	-63.22	154.60	290.06 S	154.33 E	1.16	0.58	328.56	AT 151.98
700.0	605.12	312.22	159.941	-63.93	153.79	310.10 S	164.01 E	1.59	0.80	350.80	AT 152.13
750.0	650.06	331.42	170.500	-64.08	153.82	329.76 S	173.69 E	0.30	0.15	372.70	AT 152.22
800.0	695.18	350.33	180.844	-64.85	153.54	349.08 S	183.24 E	1.56	0.78	394.25	AT 152.30
850.0	740.56	368.74	190.938	-65.48	153.92	367.91 S	192.54 E	1.30	0.65	415.24	AT 152.38
900.0	786.12	386.81	200.809	-65.89	153.38	386.36 S	201.68 E	0.93	0.47	435.83	AT 152.44
950.0	831.93	404.49	210.221	-66.87	152.65	404.21 S	210.76 E	2.05	1.02	455.86	AT 152.46
1000.0	877.94	421.85	219.268	-67.04	152.41	421.58 S	219.79 E	0.39	0.19	475.43	AT 152.46
1050.0	924.11	438.96	227.939	-67.83	151.31	438.50 S	228.84 E	1.79	0.90	494.62	AT 152.44
1100.0	970.47	455.77	236.206	-68.16	151.06	454.91 S	237.87 E	0.69	0.34	513.35	AT 152.40
1150.0	1016.92	472.34	244.462	-68.38	151.92	471.18 S	246.70 E	0.77	0.39	531.85	AT 152.36
1200.0	1063.35	488.82	252.956	-68.09	152.61	487.59 S	255.33 E	0.77	0.39	550.39	AT 152.36
1250.0	1109.74	505.33	261.651	-68.08	152.93	504.18 S	263.87 E	0.24	0.12	569.06	AT 152.37
1300.0	1156.19	521.81	270.064	-68.49	151.16	520.52 S	272.54 E	1.55	0.77	587.55	AT 152.36
1350.0	1202.61	538.53	278.144	-67.89	150.42	536.73 S	281.60 E	1.32	0.66	606.12	AT 152.32
1400.0	1248.85	555.90	285.905	-67.38	147.77	553.05 S	291.38 E	2.26	1.13	625.11	AT 152.22
1450.0	1294.87	573.77	293.855	-66.55	150.15	569.81 S	301.46 E	2.49	1.25	644.64	AT 152.12
1500.0	1340.84	591.62	302.131	-67.11	149.60	586.83 S	311.33 E	1.20	0.60	664.30	AT 152.05
1550.0	1386.96	609.21	310.097	-67.46	149.13	603.44 S	321.17 E	0.79	0.39	683.59	AT 151.98
1600.0	1433.16	626.65	317.928	-67.58	149.23	619.86 S	330.96 E	0.25	0.13	702.68	AT 151.90
1650.0	1479.39	644.05	325.665	-67.64	148.71	636.18 S	340.78 E	0.41	0.21	721.71	AT 151.82
1700.0	1525.63	661.52	333.195	-67.63	147.92	652.37 S	350.77 E	0.60	0.30	740.70	AT 151.73
1750.0	1571.91	678.95	340.534	-67.92	147.75	668.38 S	360.84 E	0.59	0.30	759.56	AT 151.64
1800.0	1618.29	696.25	347.585	-68.20	146.59	684.08 S	370.97 E	1.03	0.52	778.19	AT 151.53

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-477 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION
1850.0	1664.74	713.53	354.230	-68.34	145.48	699.43 S	381.31 E	0.87	0.43	796.62	AT 151.40
1900.0	1711.28	730.72	360.407	-68.80	144.04	714.35 S	391.85 E	1.40	0.70	814.77	AT 151.25
1950.0	1757.98	747.68	365.995	-69.35	142.41	728.66 S	402.54 E	1.60	0.80	832.45	AT 151.08
2000.0	1804.78	764.51	371.234	-69.37	142.18	742.60 S	413.31 E	0.17	0.08	849.87	AT 150.90
2050.0	1851.55	781.43	376.340	-69.22	141.40	756.49 S	424.25 E	0.63	0.31	867.33	AT 150.72
2100.0	1898.31	798.38	381.377	-69.35	141.69	770.34 S	435.25 E	0.33	0.17	884.80	AT 150.53
2150.0	1945.20	815.01	386.389	-70.00	141.86	783.98 S	445.99 E	1.31	0.65	901.96	AT 150.37
2200.0	1992.17	831.41	391.360	-69.92	141.87	797.46 S	456.58 E	0.16	0.08	918.91	AT 150.21

```
*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*  2200.0 FEET EQUALS   918.91   FEET AT  150.21            *
*                         ********                          *
*************************************************************
```

BARRINGER LABORATORIES, INC.

RENO, NEVADA, U.S.A., 5301 Longley Lane, Bldg. E, Reno, NV, 89511, TEL: 702-828-1158, FAX: 702-828-1263

BARRINGER LABORATORIOS de MEXICO, S.A.de C.V.
Carretera Panamericana, KM 10445
Durango, Durango, Mexico C.P. 34030
TEL/FAX (52)(18) 12-00-52

BARRINGER LABORATORIES del PERU S.A.
Avenida Domingo Orué 489
Surquillo, Lima 34, Peru
TEL (011-51-1) 222-2801
FAX (011-51-1) 442-7195

BARRINGER de COLOMBIA
Calle 80 Sur N. 47D-65, L-106
Sabaneta, Colombia
TEL (574) 301-0704

BARRINGER LABORATORIOS de MEXICO, S.A. de C.V.
Blvd. García Morales 829-A, Bodega #2
Colonia La Manga
Hermosillo, Sonora, Mexico C.P. 83210
TEL/FAX (011-52-6) 261-0415

BARRINGER LABORATORIES NICARAGUA
COMPLEJO OCAL
Km 7.5 Carretera Norte
Managua, Nicaragua
TEL (011-50-5) 883-0778

McCLELLAND/BARRINGER LABORATORIOS HONDURAS
Kilometro 5,
Boulevard Suyapa
Tegucigalpa, M.D.C., Honduras
TEL (011-50-4) 231-1841

Work Order # _____
Date Received 10-9-99
Purchase Order # _____
Project # _____
Date Shipped 10/9/99
Shipped Via Barringer PU
# of Cartons _____
# of Samples _____

Geochemical Laboratory Instruction Sheet

Copy of Results:	Results And Invoice To:
Fax to Kurt D. Allen	Kurt D. Allen
@ 775-623-6967	Hecla Mining Co.
	P.O. Box 2610
	Winnemucca, NV. 89446
	AUTHORITY:

No. of Samples	Sample Type	List of Sample Numbers	Elements Requested
308	RVC	RS-477 0-5 through 1535-1540	Geochem/composite request
			to follow
1	Pulp	Rosebud Production standard @ end of hole	

COARSE REJECT (Free storage for 30 days)
- [x] Return/collect after analysis
- [ ] Return/collect after 30 days
- [ ] Discard after 30 days

IF NOT MARKED, REJECT DISCARDED AFTER 30 DAYS

PULP (Free storage for 6 months)
- [x] Return/collect after analysis
- [ ] Return/collect at 6 months
- [ ] Discard at 6 months

IF NOT MARKED, PULP IS DISCARDED AFTER 6 MONTHS

COARSE REJECTS/PULPS WILL BE DISCARDED UNLESS OTHERWISE REQUESTED

Au - GOLD METHOD
- [ ] Fire Assay/A.A.
- [ ] Fire Assay/Gravimetric
- [ ] NaCN/A.A.

RESULTS REPORTED IN:
- [ ] ppb
- [ ] PPM
- [x] oz/T
- [ ] grams/T

TRACE ELEMENT METHOD
- [ ] Wet Chem./A.A.
- [ ] Wet Chem./ICP

RESULTS REPORTED IN:
- [ ] ppm
- [ ] Percent %
- [x] oz/T
- [ ] grams/T

ADDITIONAL INSTRUCTIONS:
Results go only to Kurt Allen

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **HECLA MINING COMPANY** *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-477 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/07/99

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

TIE-ON COORDINATES AT: 0 M.D.
TAKEN FROM: COLLAR

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 378'

********** DEPTH MEASURED IN FEET *******
****

COMMENTS: ***** EKLUND *****
** GREG SECRIST **

PROJECTED F/1520' T/1540'.

*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *

****
COMPANY REPRESENTATIVE
****

GREG

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-477 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION
0.0	0.00	0.00	0.000	-55.85	150.55	0.00 N	0.00 E	0.00		0.00	AT 000.00
50.0	41.54	25.10	12.032	-56.50	150.68	24.25 S	13.66 E	1.31	0.65	27.83	AT 150.61
100.0	83.51	49.57	23.860	-57.65	150.92	47.97 S	26.92 E	2.31	1.16	55.01	AT 150.71
150.0	125.71	73.59	35.735	-57.52	151.68	71.48 S	39.79 E	0.86	0.43	81.81	AT 150.90
200.0	168.12	97.26	47.632	-58.49	151.69	94.81 S	52.35 E	1.94	0.97	108.30	AT 151.09
250.0	210.91	120.35	59.278	-59.23	151.85	117.59 S	64.58 E	1.49	0.74	134.16	AT 151.22
300.0	253.87	143.20	70.796	-59.20	151.65	140.13 S	76.70 E	0.21	0.11	159.75	AT 151.31
350.0	296.87	165.94	82.362	-59.45	152.28	162.64 S	88.69 E	0.81	0.41	185.25	AT 151.40
400.0	340.11	188.21	93.938	-60.27	152.64	184.90 S	100.29 E	1.68	0.84	210.35	AT 151.52
450.0	383.64	210.06	105.236	-60.79	152.04	206.69 S	111.71 E	1.20	0.60	234.95	AT 151.61
500.0	427.42	231.58	116.216	-61.42	152.02	228.03 S	123.04 E	1.26	0.63	259.11	AT 151.65
550.0	471.47	252.59	127.069	-62.13	152.63	248.97 S	134.03 E	1.53	0.77	282.75	AT 151.71
600.0	515.80	272.97	138.006	-62.76	153.82	269.62 S	144.45 E	1.67	0.84	305.87	AT 151.82
650.0	560.35	292.79	149.086	-63.22	154.60	290.06 S	154.33 E	1.16	0.58	328.56	AT 151.98
700.0	605.12	312.22	159.941	-63.93	153.79	310.10 S	164.01 E	1.59	0.80	350.80	AT 152.13
750.0	650.06	331.42	170.500	-64.08	153.82	329.76 S	173.69 E	0.30	0.15	372.70	AT 152.22
800.0	695.18	350.33	180.844	-64.85	153.54	349.08 S	183.24 E	1.56	0.78	394.25	AT 152.30
850.0	740.56	368.74	190.938	-65.48	153.92	367.91 S	192.54 E	1.30	0.65	415.24	AT 152.38
900.0	786.12	386.81	200.809	-65.89	153.38	386.36 S	201.68 E	0.93	0.47	435.83	AT 152.44
950.0	831.93	404.49	210.221	-66.87	152.65	404.21 S	210.76 E	2.05	1.02	455.86	AT 152.46
1000.0	877.94	421.85	219.268	-67.04	152.41	421.58 S	219.79 E	0.39	0.19	475.43	AT 152.46
1050.0	924.11	438.96	227.939	-67.83	151.31	438.50 S	228.84 E	1.79	0.90	494.62	AT 152.44
1100.0	970.47	455.77	236.206	-68.16	151.06	454.91 S	237.87 E	0.69	0.34	513.35	AT 152.40
1150.0	1016.92	472.34	244.462	-68.38	151.92	471.18 S	246.70 E	0.77	0.39	531.85	AT 152.36
1200.0	1063.35	488.82	252.956	-68.09	152.61	487.59 S	255.33 E	0.77	0.39	550.39	AT 152.36
1250.0	1109.74	505.33	261.651	-68.08	152.93	504.18 S	263.87 E	0.24	0.12	569.06	AT 152.37
1300.0	1156.19	521.81	270.064	-68.49	151.16	520.52 S	272.54 E	1.55	0.77	587.55	AT 152.36
1350.0	1202.61	538.53	278.144	-67.89	150.42	536.73 S	281.60 E	1.32	0.66	606.12	AT 152.32
1400.0	1248.85	555.90	285.905	-67.38	147.77	553.05 S	291.38 E	2.26	1.13	625.11	AT 152.22
1450.0	1294.87	573.77	293.855	-66.55	150.15	569.81 S	301.46 E	2.49	1.25	644.64	AT 152.12
1500.0	1340.84	591.62	302.131	-67.11	149.60	586.83 S	311.33 E	1.20	0.60	664.30	AT 152.05
1540.0	1377.73	605.69	308.527	-67.44	149.30	600.14 S	319.19 E	0.87	0.35	679.74	AT 151.99

```
*************************************************************
*                        ********                           *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                        ********                           *
*  1540.0 FEET EQUALS   679.74   FEET AT  151.99            *
*                        ********                           *
*************************************************************
```

RS-477-99

Depth From	To	Interval	Au	Ag	ICP	Composite Interval	Sample Number
1539.5	1545	5.5	x	x			1
1545	1548.5	3.5	x	x			2
1548.5	1557	8.5	x	x			3
1557	1561.5	4.5	x	x			4
1561.5	1566.1	4.6	x	x			5
1566.1	1576	9.9	x	x			6
1576	1584	8	x	x			7
1584	1591.5	7.5	x	x	x	52	8
1591.5	1599.5	8	x	x			9
1599.5	1605	5.5	x	x			10
1605	1610	5	x	x			11
1610	1620.5	10.5	x	x			12
1620.5	1631	10.5	x	x			13
1631	1641.5	10.5	x	x	x	50	14
1641.5	1647	5.5	x	x			15
1647	1650.5	3.5	x	x			16
1650.5	1656.5	6	x	x			17
1656.5	1667	10.5	x	x			18
1667	1677.5	10.5	x	x			19
1677.5	1686.5	9	x	x			20
1686.5	1689.6	3.1	x	x	x	48.1	21
1689.6	1695	5.4	x	x			22
1695	1700	5	x	x			23
1700	1710	10	x	x			24
1710	1720	10	x	x			25
1720	1730	10	x	x			26
1730	1737	7	x	x	x	47.4	27
1737	1747.5	10.5	x	x			28
1747.5	1757	9.5	x	x			29
1757	1767.5	10.5	x	x			30
1767.5	1773	5.5	x	x			31
1773	1777.5	4.5	x	x			32
1777.5	1787.5	10	x	x	x	50.5	33
1787.5	1798	10.5	x	x			34
1798	1808.5	10.5	x	x			35
1808.5	1819	10.5	x	x			36
1819	1826	7	x	x			37
1826	1836	10	x	x			38
1836	1839.5	3.5	x	x	x	52	39
1839.5	1850	10.5	x	x			40
1850	1860.5	10.5	x	x			41
1860.5	1867.5	7	x	x			42
1867.5	1873	5.5	x	x			43
1873	1883.5	10.5	x	x			44
1883.5	1894	10.5	x	x	x	54.5	45

1894	1904.5	10.5	x	x			46
1904.5	1915	10.5	x	x			47
1915	1925.5	10.5	x	x			48
1925.5	1935	9.5	x	x			49
1935	1945	10	x	x			50
1945	1952.3	7.3	x	x	x	58.3	51
1952.3	1955	2.7	x	x			52
1955	1960.5	5.5	x	x			53
1960.5	1965.5	5	x	x			54
1965.5	1973	7.5	x	x			55
1973	1980.5	7.5	x	x			56
1980.5	1988	7.5	x	x			57
1988	1991.5	3.5	x	x			58
1991.5	1998.5	7	x	x			59
1998.5	2004.7	6.2	x	x	x	52.4	60
2004.7	2012	7.3	x	x			61
2012	2018	6	x	x			62
2018	2025.3	7.3	x	x			63
2025.3	2028.3	3	x	x			64
2028.3	2038.5	10.2	x	x	x	33.8	65
2038.5	2045.3	6.8	x	x			66
2045.3	2055	9.7	x	x			67
2055	2062	7	x	x			68
2062	2068.5	6.5	x	x			69
2068.5	2141.7	73.2	x	x	x	103.2	70
2141.7	2150	8.3	x	x			71
2150	2158	8	x	x			72
2158	2161	3	x	x			73
2161	2169	8	x	x			74
2169	2175.2	6.2	x	x			75
2175.2	2183.5	8.3	x	x			76
2183.5	2191	7.5	x	x	x	49.3	77
2191	2202.5	11.5	x	x			78
2202.5	2213	10.5	x	x			79
2213	2223	10	x	x			80
2223	2232	9	x	x	x	41	81

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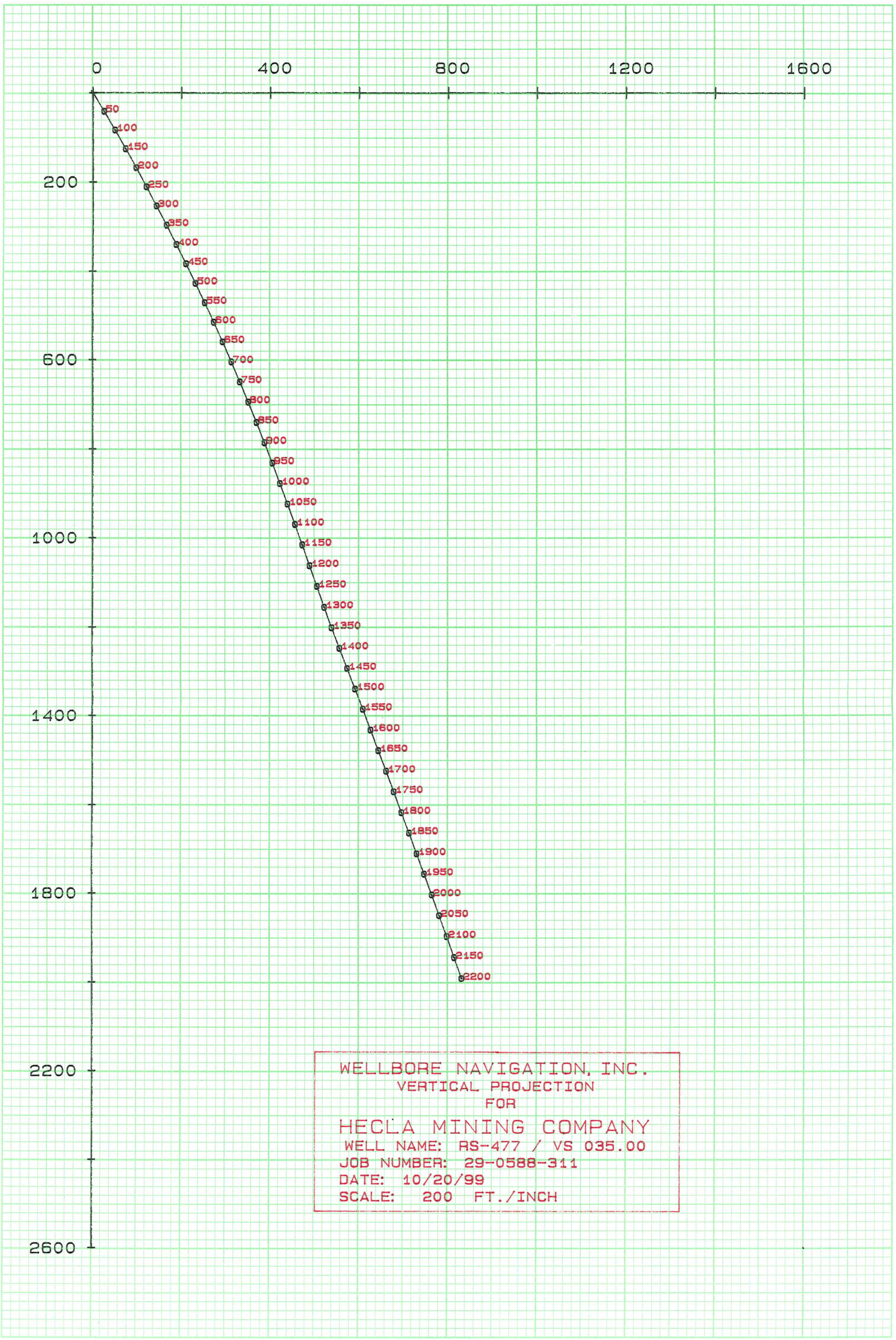

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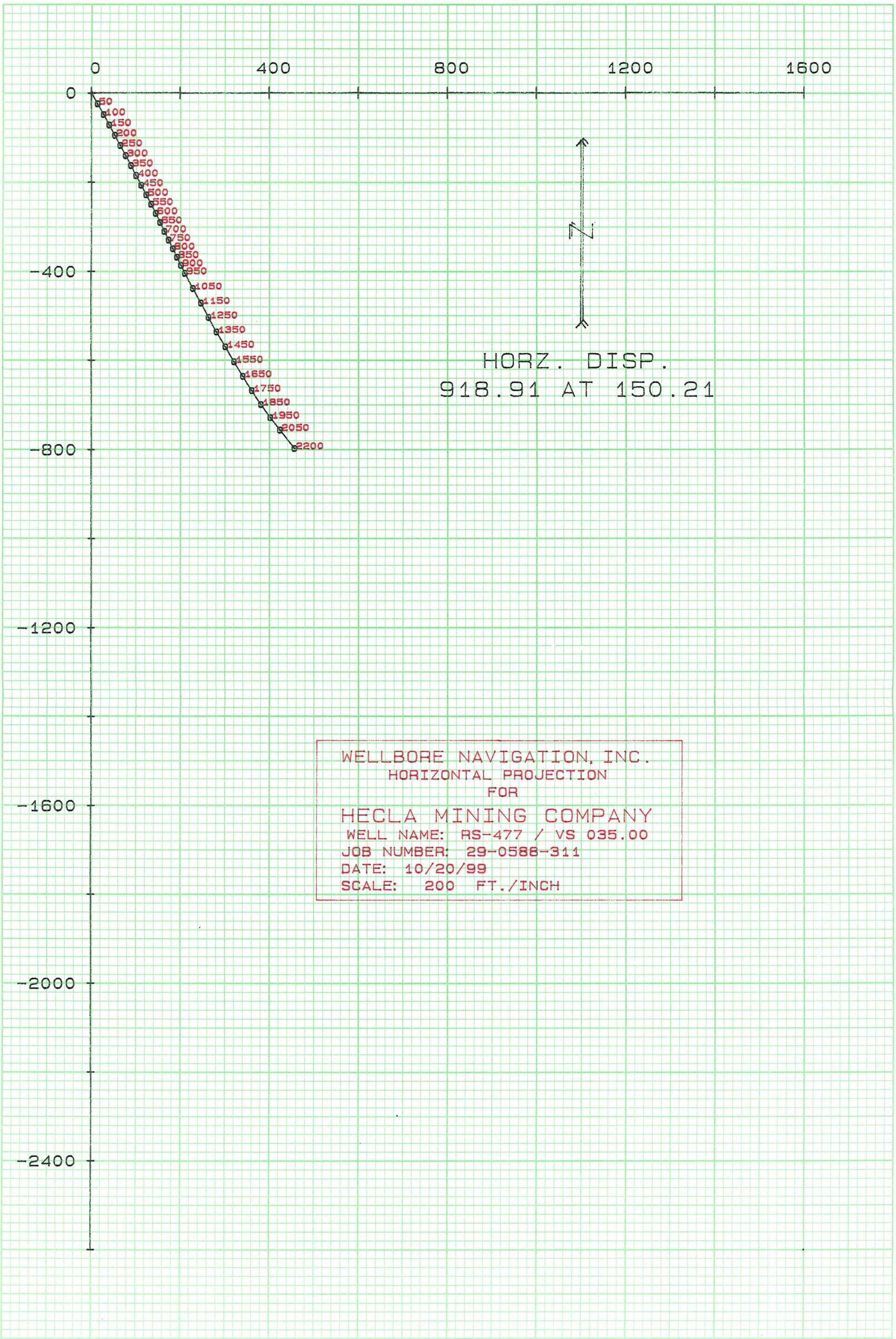

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-477 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION
0.0	0.00	0.00	0.000	-55.85	150.55	0.00 N	0.00 E	0.00		0.00	AT 000.00
50.0	41.54	25.10	12.032	-56.50	150.68	24.25 S	13.66 E	1.31	0.65	27.83	AT 150.61
100.0	83.51	49.57	23.860	-57.65	150.92	47.97 S	26.92 E	2.31	1.16	55.01	AT 150.71
150.0	125.71	73.59	35.735	-57.52	151.68	71.48 S	39.79 E	0.86	0.43	81.81	AT 150.90
200.0	168.12	97.26	47.632	-58.49	151.69	94.81 S	52.35 E	1.94	0.97	108.30	AT 151.09
250.0	210.91	120.35	59.278	-59.23	151.85	117.59 S	64.58 E	1.49	0.74	134.16	AT 151.22
300.0	253.87	143.20	70.796	-59.20	151.65	140.13 S	76.70 E	0.21	0.11	159.75	AT 151.31
350.0	296.87	165.94	82.362	-59.45	152.28	162.64 S	88.69 E	0.81	0.41	185.25	AT 151.40
400.0	340.11	188.21	93.938	-60.27	152.64	184.90 S	100.29 E	1.68	0.84	210.35	AT 151.52
450.0	383.64	210.06	105.236	-60.79	152.04	206.69 S	111.71 E	1.20	0.60	234.95	AT 151.61
500.0	427.42	231.58	116.216	-61.42	152.02	228.03 S	123.04 E	1.26	0.63	259.11	AT 151.65
550.0	471.47	252.59	127.069	-62.13	152.63	248.97 S	134.03 E	1.53	0.77	282.75	AT 151.71
600.0	515.80	272.97	138.006	-62.76	153.82	269.62 S	144.45 E	1.67	0.84	305.87	AT 151.82
650.0	560.35	292.79	149.086	-63.22	154.60	290.06 S	154.33 E	1.16	0.58	328.56	AT 151.98
700.0	605.12	312.22	159.941	-63.93	153.79	310.10 S	164.01 E	1.59	0.80	350.80	AT 152.13
750.0	650.06	331.42	170.500	-64.08	153.82	329.76 S	173.69 E	0.30	0.15	372.70	AT 152.22
800.0	695.18	350.33	180.844	-64.85	153.54	349.08 S	183.24 E	1.56	0.78	394.25	AT 152.30
850.0	740.56	368.74	190.938	-65.48	153.92	367.91 S	192.54 E	1.30	0.65	415.24	AT 152.38
900.0	786.12	386.81	200.809	-65.89	153.38	386.36 S	201.68 E	0.93	0.47	435.83	AT 152.44
950.0	831.93	404.49	210.221	-66.87	152.65	404.21 S	210.76 E	2.05	1.02	455.86	AT 152.46
1000.0	877.94	421.85	219.268	-67.04	152.41	421.58 S	219.79 E	0.39	0.19	475.43	AT 152.46
1050.0	924.11	438.96	227.939	-67.83	151.31	438.50 S	228.84 E	1.79	0.90	494.62	AT 152.44
1100.0	970.47	455.77	236.206	-68.16	151.06	454.91 S	237.87 E	0.69	0.34	513.35	AT 152.40
1150.0	1016.92	472.34	244.462	-68.38	151.92	471.18 S	246.70 E	0.77	0.39	531.85	AT 152.36
1200.0	1063.35	488.82	252.956	-68.09	152.61	487.59 S	255.33 E	0.77	0.39	550.39	AT 152.36
1250.0	1109.74	505.33	261.651	-68.08	152.93	504.18 S	263.87 E	0.24	0.12	569.06	AT 152.37
1300.0	1156.19	521.81	270.064	-68.49	151.16	520.52 S	272.54 E	1.55	0.77	587.55	AT 152.36
1350.0	1202.61	538.53	278.144	-67.89	150.42	536.73 S	281.60 E	1.32	0.66	606.12	AT 152.32
1400.0	1248.85	555.90	285.905	-67.38	147.77	553.05 S	291.38 E	2.26	1.13	625.11	AT 152.22
1450.0	1294.87	573.77	293.855	-66.55	150.15	569.81 S	301.46 E	2.49	1.25	644.64	AT 152.12
1500.0	1340.84	591.62	302.131	-67.11	149.60	586.83 S	311.33 E	1.20	0.60	664.30	AT 152.05
1540.0	1377.73	605.69	308.527	-67.44	149.30	600.14 S	319.19 E	0.87	0.35	679.74	AT 151.99

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*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*  1540.0 FEET EQUALS   679.74   FEET AT  151.99            *
*                         ********                          *
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* **HECLA MINING COMPANY** *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-477 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/07/99

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

TIE-ON COORDINATES AT: 0 M.D.
TAKEN FROM: COLLAR

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 378'

********** DEPTH MEASURED IN FEET *******

COMMENTS: ***** EKLUND *****
** GREG SECRIST **

PROJECTED F/1520' T/1540'.

*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *

COMPANY REPRESENTATIVE

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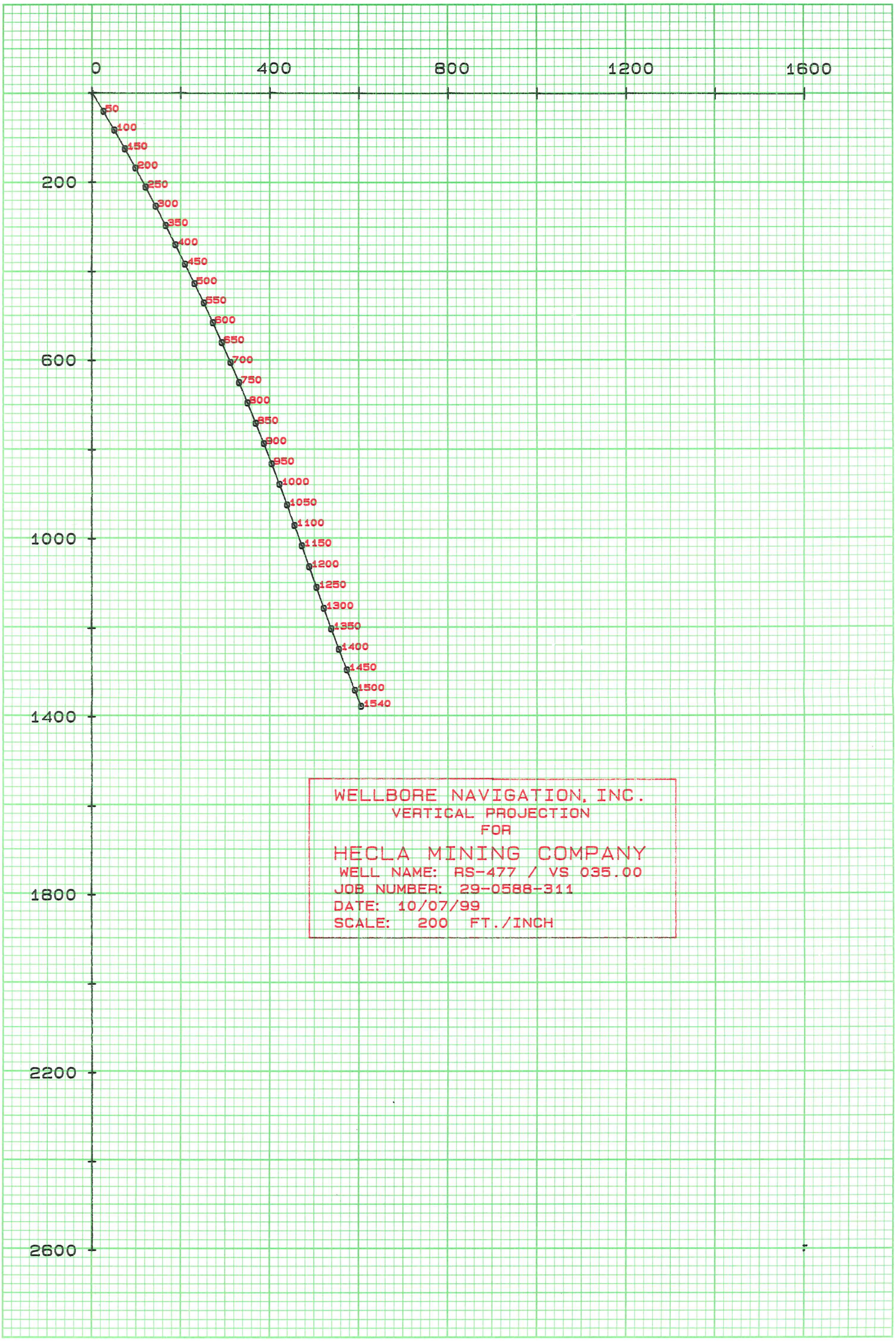

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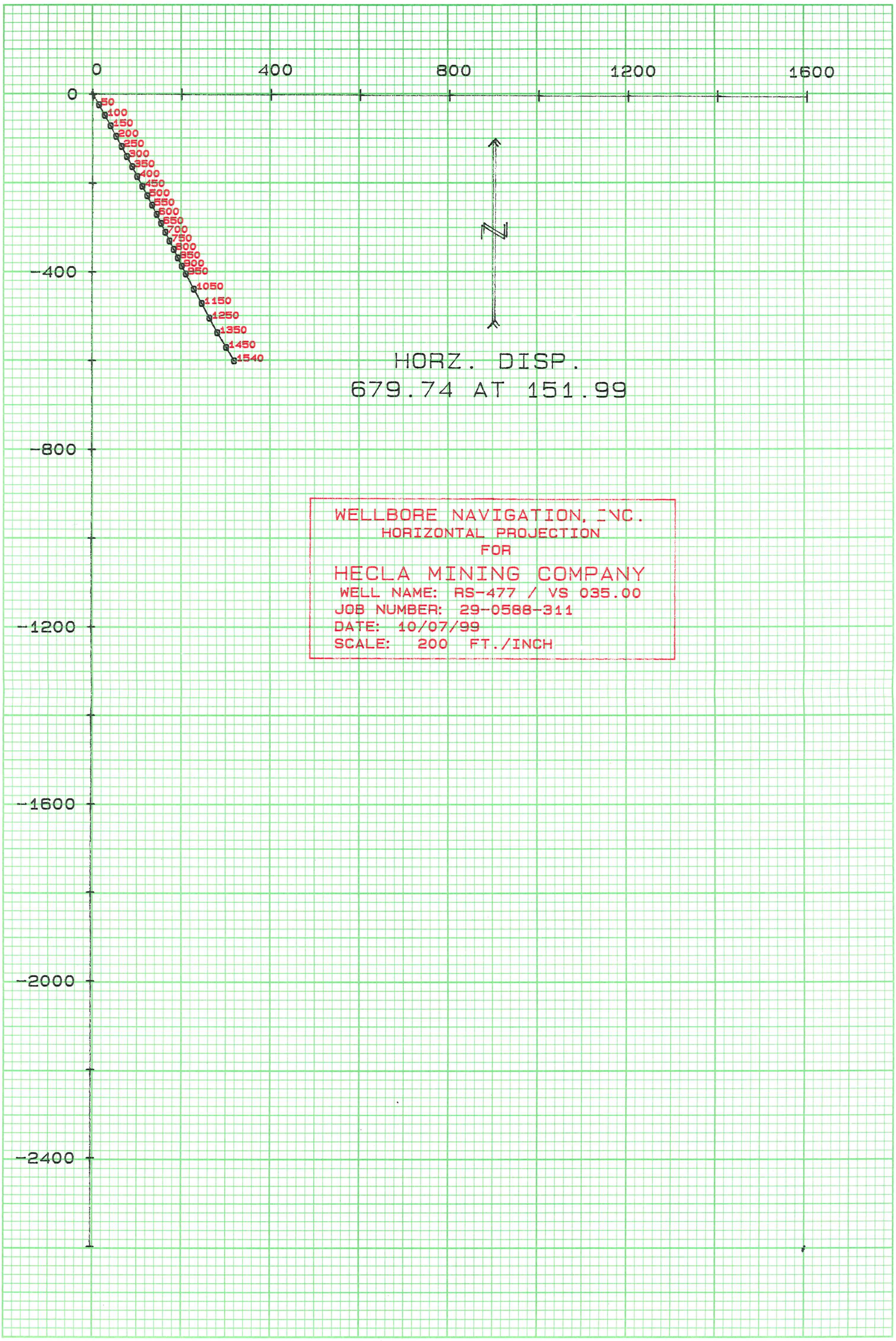

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-477 / VS 035.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISP.	DISPLACEMENT DIRECTION	TEMP. DEG F
0.0	0.00	0.00	0.000	-55.85	150.55	0.00 N	0.00 E	0.00		0.00	AT 000.00	
50.0	41.54	25.10	12.032	-56.50	150.68	24.25 S	13.66 E	1.31	0.65	27.83	AT 150.61	059.64
100.0	83.51	49.57	23.860	-57.65	150.92	47.97 S	26.92 E	2.31	1.16	55.01	AT 150.71	059.57
150.0	125.71	73.59	35.735	-57.52	151.68	71.48 S	39.79 E	0.86	0.43	81.81	AT 150.90	059.58
200.0	168.12	97.26	47.632	-58.49	151.69	94.81 S	52.35 E	1.94	0.97	108.30	AT 151.09	059.64
250.0	210.91	120.35	59.278	-59.23	151.85	117.59 S	64.58 E	1.49	0.74	134.16	AT 151.22	059.61
300.0	253.87	143.20	70.796	-59.20	151.65	140.13 S	76.70 E	0.21	0.11	159.75	AT 151.31	059.66
350.0	296.87	165.94	82.362	-59.45	152.28	162.64 S	88.69 E	0.81	0.41	185.25	AT 151.40	059.68
400.0	340.11	188.21	93.938	-60.27	152.64	184.90 S	100.29 E	1.68	0.84	210.35	AT 151.52	059.91
450.0	383.64	210.06	105.236	-60.79	152.04	206.69 S	111.71 E	1.20	0.60	234.95	AT 151.61	060.22
500.0	427.42	231.58	116.216	-61.42	152.02	228.03 S	123.04 E	1.26	0.63	259.11	AT 151.65	061.29
540.0	462.59	248.53	124.917	-61.69	152.33	244.88 S	131.94 E	0.77	0.31	278.16	AT 151.68	062.44

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*************************************************************
*                        ********                           *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                        ********                           *
*   540.0 FEET EQUALS   278.16   FEET AT  151.68            *
*                        ********                           *
*************************************************************
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

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* HECLA MINING COMPANY *
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JOB NUMBER: 29-0588-311

WELL NAME: RS-477 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 09/28/99

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

TIE-ON COORDINATES AT: 0 M.D.
TAKEN FROM: COLLAR

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 376'

WELNAV

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ***** EKLUND *****
** GREG SECRIST **

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** ********** **
** COMPANY REPRESENTATIVE **
****
****

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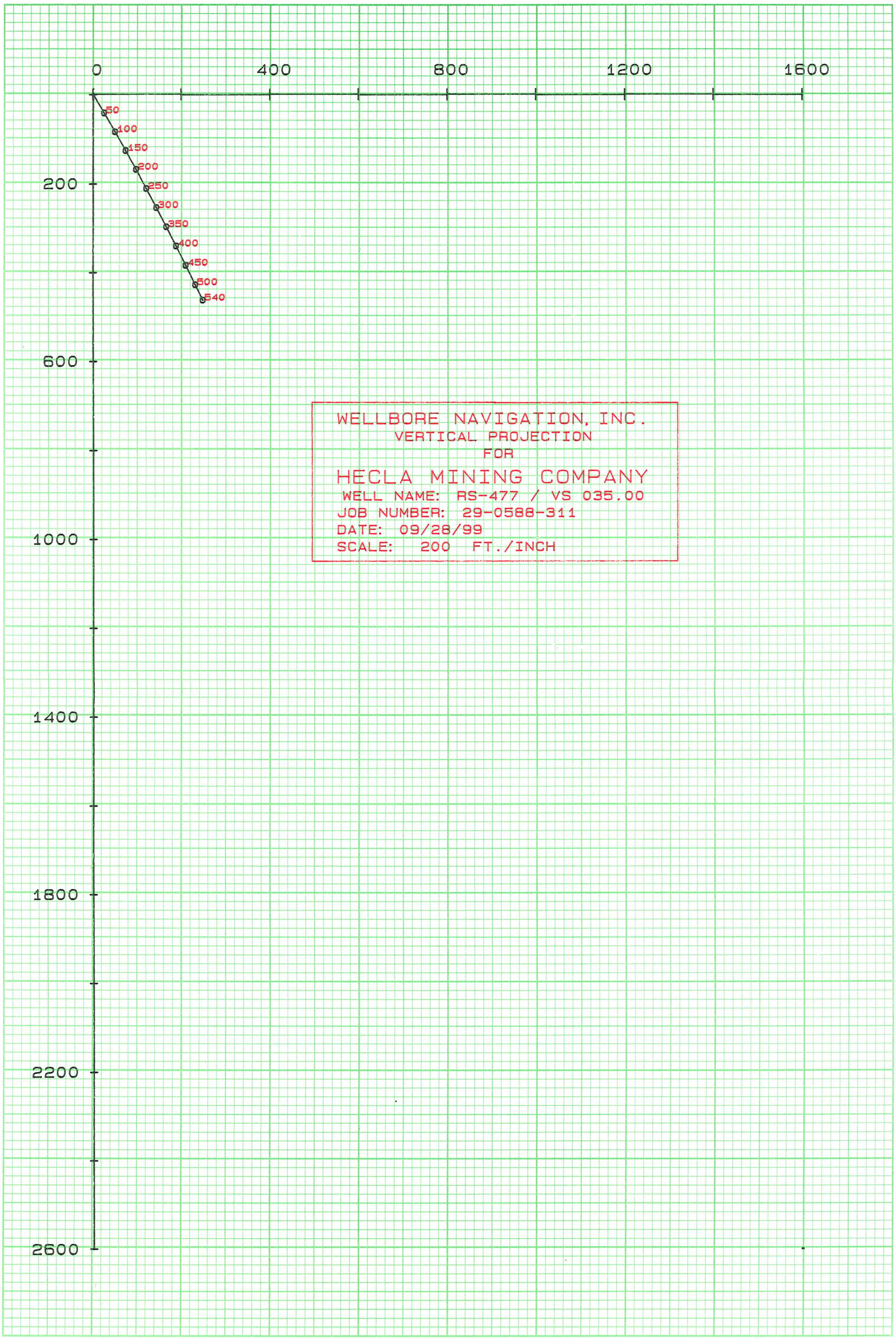
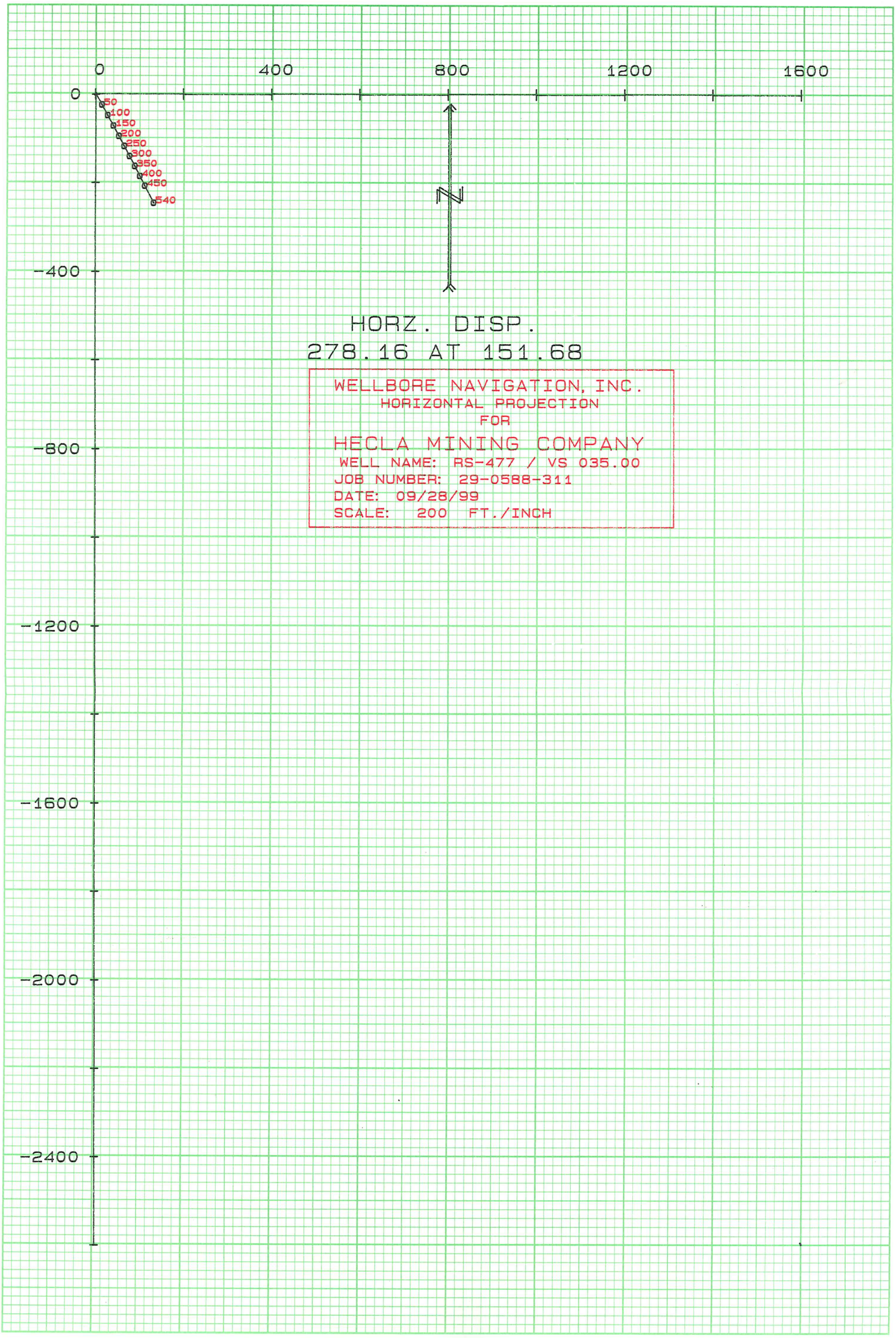
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